

amateur radio

JOURNAL OF THE WIRELESS INSTITUTE OF AUSTRALIA



VOL. 46 No. 6

JUNE 1981

FEATURED IN THIS ISSUE:

- ★ A MORE COMPLETE ANTENNA TEST — BELIEFS AND FACTS
- ★ CROWBARS AND SCR_s
- ★ VK2TTY NEWS
- ★ OPERATION WHITESTICK

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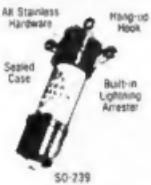


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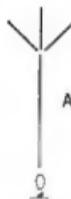
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JUNE 1981

VOL. 49, No. 6

PRICE: \$1.30

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Caulfield North 3161.

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specifically requested. All important items
should be sent by certified mail. The editor
reserves the right to edit all material, includ-
ing Letters to the Editor, News Items, Headlines,
and reserves the right to refuse acceptance
of any material, without specifying a reason.
Material should be sent direct to P.O. Box
150, Toorak, Vic. 3142, by the 25th of the
second month preceding publication. Phone:
(03) 528 5982. Hamads should be sent direct
to the same address by the 1st of the month
preceding publication.

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are in force between the buyer and the
seller.

Typesetting: MUELLER GRAPHICS PTY LTD.
1a Levanswell Road, Moorabbin, 3189
Tel.: 553 0292

Printers: WAVERLEY OFFSET PUBLISHING
GROUP
Geddes Street, Mulgrave 3170



amateur radio



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10 MHz BAND EXPECTED TO BE
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Cover Photo



Mr. Ross Ramsay, First Assistant Secretary of the Department of Communications, officially hands the Remembrance Day Contest trophy to Jenny Warrington VK5ANW, representing the VK5 Division which won the trophy in 1980. The ceremony took place at the WIA Federal Convention dinner in Melbourne in May. David Wardlaw VK3ADW, Immediate Past President, looks on.

Australia-Wide Amateur Radio Issues Discussed

The Annual General Meeting (the Federal Convention) of the WIA is the main forum where Divisional Representatives (the Federal Councillors) meet to discuss and formulate policies on current amateur radio subjects which are of interest to all amateurs throughout Australia.

The 1981 Federal Convention (the 45th such Annual Convention) in Melbourne on 2nd, 3rd and 4th May did exactly this. A more detailed report will follow in next month's AR but some items will be of general interest.

The proposed Australian Table of Frequency Allocations update elicited the fact that the omission of the footnote relating to the temporary use of the 576-585 MHz band had occurred through an oversight. The use of 50-52 MHz (or, at least, 50-50.15 MHz) continues to pose problems for the central office planners. This was reported in March AR, page 7. A WIA band plan for FM on 6 metres was formulated.

In debate it was agreed that pressure be continued for the use of the segment 3.7 to 3.9 MHz of the 80m band. The policy of exerting pressure for the very early allocation of the 10 MHz band (secondary user) as well as the 18 and 24 MHz bands was endorsed and must be maintained. The need was foreseen to get as many amateurs as possible to operate on these bands when they are released for amateur use. In relation to the narrow 10 MHz band (10.1-10.15 MHz) it was resolved to apply a gentleman's agreement to limit this band to AOCP holders. It should be split CW/Phone (SSB) similarly to the 14 MHz band, i.e. 15 kHz CW only and the remainder (35 kHz) for Phone and CW, with a power limitation to be resolved internationally through the IARU R3 Association. Contests and awards being banned appeared sensible but is a wider issue.

On 10 metres it was agreed to represent to the International

Beacon Project Co-ordinator that the upper and lower limits of the beacon segment be limited to 28.3 MHz and 28.2 MHz respectively. It was also agreed to ask for an Australian beacon segment of 28.26 to 28.272 MHz inclusive.

The Institute does not support any extensions of privileges to NAOCP and LAOCP operators upon obtaining a combination K suffix or equivalent. Equally there was no support to extend Novice privileges as no compelling evidence for this has come forward.

In addition to the WICEN net frequencies on various bands, it was agreed that 21190 and 28450 kHz should be reserved for all properly identified WICEN communications purposes when so required.

We now have AMSAT AUSTRALIA replacing Project Australia and a WIA SUSS500 donations to AMSAT to help towards the replacement of Ph. III satellite lost last year. More publicity should be given that WICEN is an Amateur Radio Service commitment. A Federal Technical Advisory Committee (FETAC) is to be set up to absorb the existing VHFA/C, repeater and other technical committees. The 1981 WIA Call Book is to be an updated and expanded version of the 1979 Call Book and to include such extras as Club Awards. No change for slow morse frequency on 80m. Budget for 1982 was prepared envisaging a small inflation-ratio increase in the Federal element of subscriptions which must be supplemented by increased new membership recruiting drives. The Institute supports the concept of affiliation to the Federal WIA of nationwide societies and the Executive was directed to re-draft the proposals on how this is to be achieved. More next month.

The Institute sent a letter to the Minister during April expressing concern about harmful interference in the amateur bands and reporting procedures.

WIANEWS SPECIAL Mr. Ross Ramsay addresses Federal Delegates

INTRUDER WATCHERS PLEASE GET BUSY (see May AR).

During the 1981 Federal Convention Mr. Ross Ramsay, First Assistant Secretary of the Department of Communications responsible for the Radio Frequency Management Division, attended as a guest and spoke as well as answering questions on many matters of amateur interest, including this:-

"Now the Russian Woodpecker has been around for a few years. Perhaps he's getting bigger and stronger as he grows up and pecking more loudly because we've been hearing a lot more from him lately. We've been listening hard at our monitoring stations and in fact we've heard him pecking away on 27.880 MHz. We don't like this very much as that is the safety frequency for harbour mobiles and we are going to send off a message to our Russian friends.

However at this stage we are not aware of any unfortunate mariner who's met his doom through the Woodpecker's activities. Incidentally, the Russians do have an assignment through the IFRB on this particular frequency.

Now we've not complained to them about the other parts

of the band at this stage because what we need is really more solid information about what degree it's really upsetting people in Australia. That means we need far harder and more detailed information. Certainly there is a campaign going on against the Woodpecker but we need these statistics as to date time frequency problems caused so that we can go to the Russians with something really solid. You don't make international complaints lightly in RFM or in any other field. I am not suggesting this matter is trivial but what I am suggesting is that you don't complain to your neighbour unless he's really making a nuisance of himself. So we would be very pleased to have more hard information from you."

Amongst many other things and in relation to the proposed new Radio Telecommunications Act, Mr. Ramsay emphasised that licence and other fees from spectrum users would be expected to cover the cost of the Department. This might have minimal effects however because both Crown and Statutory bodies would thenceforward become subject to licensing but inflation must be allowed for despite increased efficiency and the application of improved legislation. He did think however that examination fees would rise.

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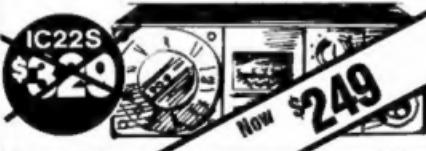
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VK QSL BUREAUX

The following is the official list of VK QSL Bureaux, all are Inwards and Outwards unless otherwise stated.

VK1 — QSL Officer, G.P.O. Box 48, Canberra, A.C.T. 2600.

VK2 — QSL Bureau, C/- Westlake R.O., Box 73, Terrible, 2284.

VK3 — Inwards QSL Bureau, Mrs. B. Gray VK3BYK, 1 Amery Street, Ashburton, Vic. 3147.

VK3 — Outwards QSL Bureau, Mr. R. R. Prosser VK3XY, 83 Strewer Road, Bentleigh, Vic. 3204.

VK4 — QSL Officer, G.P.O. Box 538, Brisbane, Qld. 4001

VK5 — QSL Bureau, Mr. Ray Dobson VK5DI, 16 Hosman Road, Fulham, S.A. 5024.

VK6 — QSL Bureau, Mr. J. Rumble VK6RUR, G.P.O. Box F318, Perth, W.A. 6001.

VK7 — QSL Bureau, G.P.O. Box S71D, Hobart, Tas. 7001.

VK8 — QSL Bureau, C/- VKBHA, P.O. Box 1418, Darwin, N.T. 0879.

VK8, 8 — Federal QSL Bureau, Mr. N. R. Penfold VK8NE, 388 Huntriss Rd., Woodlands, W.A. 6016.

DUE TO A DRAFTING ERROR, A POTENTIAL HAZARD EXISTS IN FIGS. 1, 2 AND 3 ON PAGE 42 OF THE MAY EDITION OF AMATEUR RADIO.

IN THE ARTICLE ENTITLED:

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URGENT WARNING



A More Complete Antenna Test — Beliefs and Facts

H. F. Ruckert VK2AOU
25 Barrille Road, Beverly Hills 3208

There was a time when we radio amateurs put up a new antenna, and if we worked a few countries within two weeks, we considered the new antenna as being good. These days antennas have become more complicated and more costly. Regardless of whether we build it ourselves or if we purchase one of the many manufactured types, we like to compare the gain, F/B ratio and SWR of antennas before we start with the construction or purchase.

TEST FIGURES

One problem shows up if we look for an honest consumer test report on antennas. We consult "QST" and find that the antennas advertisements don't list the gain figure. The ARRL explains that they found such wild performance claims by some manufacturers that the gain figure had to be omitted until all manufacturers measure according to international standard method. W6SAI writes in his Beam Antenna Handbook (5th edition, page 31): "Extreme caution should be exercised in accepting such claims, especially if the performance characteristics of the antenna in question seem to have been generated in the advertising department rather than the engineering department of the manufacturer." Forward gain figures which do not state the following conditions of the test are useless and misleading:

- Was the reference antenna and isotropic radiator (theoretical value) or a dipole? dB or dBD respectively should indicate this, not dB.
- Height above ground of both antennas: The test antenna has to be in such a position (considering the ground conditions) that it stands in a uniformly

supplied field of the transmitting antenna and is hit by the lowest main lobe of the radiation to receive the maximum signal.

- Was the gain figure found at the frequency which gave (for the tested antenna) the best result, and was the receiving test antenna sufficiently broad-banded not to affect the result?
- How far did the measurement deviate from the to be expected performance? Carl Greenblum of Telrex writes in QST August 1956, page 11: "To improve the gain of a 3 element full size yagi by 3 dB one has to add 3 more elements, and the boom has to be lengthened too." See Fig. 11. W6SAI shows a similar relationship on page 74 of his Beam Antenna Handbook. DL6WU (with the PMG, Germany), says in CQ-DL 5/60, page 218: "The maximum gain of a yagi type of antenna is fixed by the boom length. Doubling the boom length will only increase the max. gain by 2.2 dB." See Fig. 12.
- It is a belief and not a fact that some antennas intrinsically have a lower vertical radiation angle than others (W6SAI and others). As long as the an-

tenna is only a few wavelengths above the ground, the topography of the ground in front of the beam controls the vertical radiation angle, which can be lowered if the antenna stands at a hill top and the ground slopes downward. More on this subject can be found in the articles in QST November 1974 by W2IMU, and Ham Radio August 1979 by W2PY.

A COMPLETE ANTENNA TEST

Now having pointed out the shortcomings of many "specified" performance figures for antennas it is fair for you to ask for an example of an acceptable and reasonably complete antenna test. Perhaps the best example I can give is the work of Guenter Schwarzbek DL1BU, when testing the HB3SC or Periodic-5 antenna.

The writer described the Periodic-5 antenna (also known as VK2AOU-DJ2UT beam) in Amateur Radio April 1978. I may repeat, that no patent cover was obtained when the writer developed a new form of tri-band tuning of dipole elements used in this beam, because the manufacturers approached did not show any interest in 1958. DJ2UT added his improvements and has manufactured the P-5 beam during

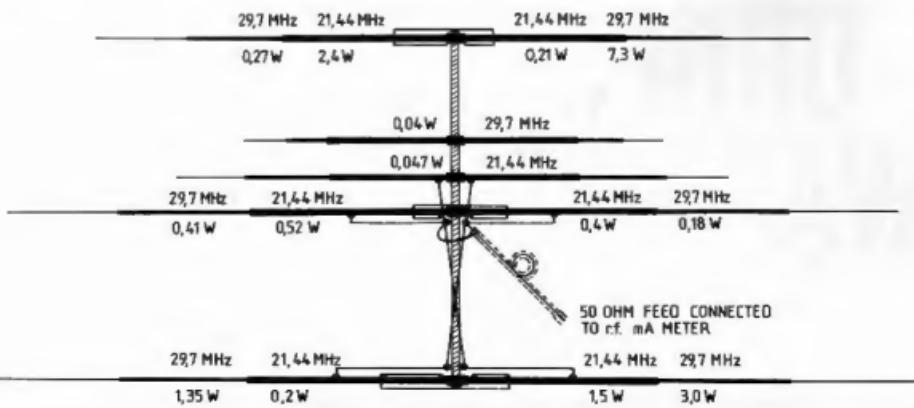


FIG. 1: The HB3SC triband beam. See text for power levels and test frequencies.

last 15 or so years, selling them to well over 40 countries, including VK-land. Also the DJ2UT design was not covered by a patent. A Japanese version of the P-5 tri-band beam has been advertised by the Taniguchi Engineering Traders Co., of Japan, in "CQ-Ham Radio" for over a year. There was no need for TET to obtain manufacturing rights, and the writer has no business connections with either DJ2UT nor TET. Mr. Mac Y. Taniguchi replied to the writer's letter: "It was a great big job what you did 22 years ago, much faster than we did, we therefore no doubt send our admiration." It may be mentioned that patents are very costly to maintain and to defend, and they last only for 16 years.

THE TET TRIBAND BEAM MODEL HB-35C

Fig. 1 shows the layout of the elements, the boom length and the element length, all of which are nearly identical to those of the P-5 beam.

Director length: 8.3 m.

28 MHz radiator: 4.9 m.

21 MHz radiator: 6.4 m.

Tri-band radiator: 10.35 m.

Reflector: 10.7 m.

Radiator T-match: 2 x 1.2 m.

Reflector T-match: 2 x 1.41 m.

Hairpin length:

Director: 0.7 m and 0.2245 m.

Radiator: 0.54 m and 0.70 m.

Reflector: 0.9 m and 0.45 m.

Element spacing:

Tri-band elements: 1.95 m and 1.99 m.

Radiators (from main rad.): 0.39 m.

The only construction difference between the P-5 and the HB35C consists of the use of tubular coaxial air capacitors (HB35C) and coaxial cable capacitors (DJ2UT, P-5).

DL1BU measured the resonance frequencies at the hairpins after removing the element ends, which shows again that the tri-band (VK2AOU) method is not using traps on the band centre frequencies but L and C phasing components. After removing the hairpin loops also the coaxial capacitor values were determined, and the loop inductance was measured as well.

The capacitor C value is to some degree affected by the unavoidable inductance of the long tubular capacitors.

Fig. 1 shows the power levels at the test frequencies of 21.44 MHz and 19.7 MHz, which are necessary at the coaxial cable choke feeder end (matched for 50 ohms) to cause 50 mA of RF current at the current lobe of the tri-band elements. Large power required at the feeder, means small element RF current. This indicates a degree of lack of symmetry, which does not affect the horizontal radiation pattern. The shorter two elements carry a substantial amount of current, which could reduce the collinear effect and gain at 21 MHz and 28 MHz. DL1BU observed the same features also on P-5 antennas he tested.

Fig. 2 and Fig. 3 demonstrate how the VSWR changes when the height of the

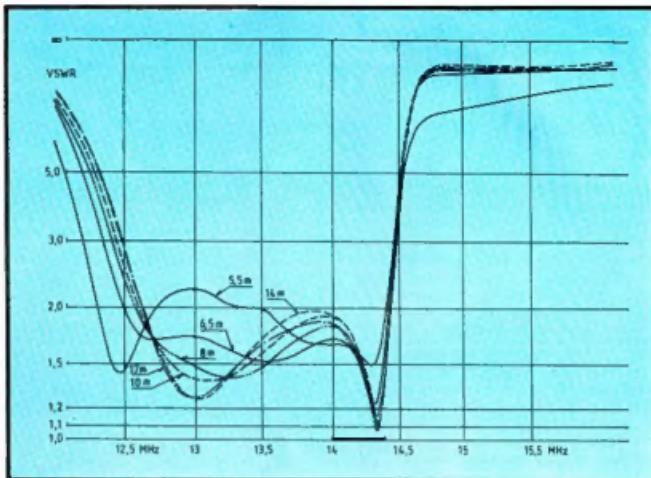


FIG. 2: VSWR of HB35C beam 12-16 MHz at various heights.

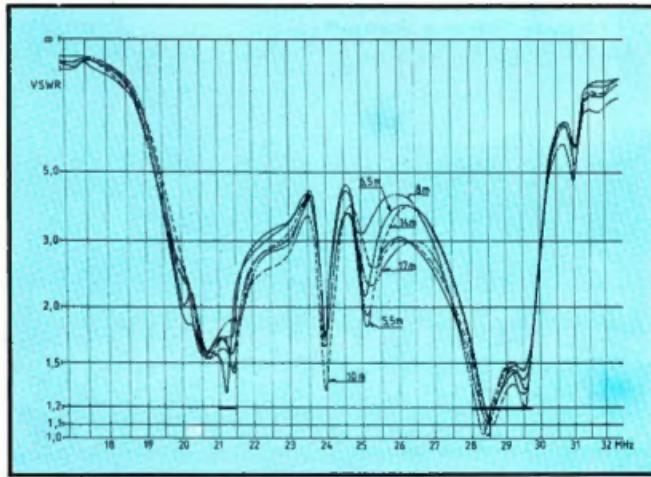


FIG. 3: VSWR of HB35C beam 17-32 MHz at various heights.

Test Resonance	Reflector	Radiator	Director	Operating Band
Loop Resonance (MHz)	17.5	20.0	20.3	15m
Loop Resonance (MHz)	24.0	26.6	28.85	10m
Loop-L	0.95	0.75	0.7	15m
uH	0.65	0.55	0.5	10m
Loop-C	55.6	53.2	53.5	15m
pF	42.7	42.1	41.5	10m

beam above ground is varied. (The original graphs were in colour.) Test runs were conducted at 5.5 m, 6.5 m, 8 m, 10 m, 14 m and 17 m height above ground. The SWR

meter head was connected between cable choke and feeder at the aerial, not at the transmitter end of the feeder. This gives the true SWR values unsuppressed by the

feeder cable losses. Thick lines indicate the 14 MHz, 21 MHz and 28 MHz bands. We can see already that this type of antenna has a very much wider SWR bandwidth than other yagi beams which have to be tuned to either the CW, phone or satellite 29.5 MHz band portion. It was also found that even transistor finals will not need a matchbox if 25 m of feeder cable or so is used, because the mismatch is very small over the whole bands. Avoiding a mismatch has not much effect on the transmitted signal strength, because 1 S point less would require a 75 per cent power loss. SWR values of less than 1.5 are only of academic value, but higher SWR values could cause insufficient loading of the final amplifier and resulting in distortion even at moderate drive levels.

Fig. 4 shows the resonances, forward gain and front to back ratio of the HB35C antenna between 12 and 31 MHz. The test antenna was 15 m above the ground. The test antenna was an active broadband dipole. Both antennas were so adjusted that the lowest main radiation lobe was used. The distance was 70 m. The dB values on the right-hand side of the graph are the power loss values between the antennas 70 m apart. Reference $\frac{1}{2}$ wave dipoles were used too and tuned to the amateur band centres, and mounted in the same position the beam was before. The solid line represents the forward gain data, and the dashed line the backward radiated value (the difference is the f/b-ratio). It is interesting to see how the gain and the f/b-ratio vary over the 14 MHz, 21 MHz and 28 MHz bands. This demonstrates that one single gain figure for all bands or even for each band just can't be correct, and the same goes for the f/b-ratio. This applies to all other directional antennas!

Figs. 5, 6 and 7 show in more detail the frequency dependence of the SWR of the HB35C antenna. At the transmitter end of the feeder coaxial cable of about 30 m length the SWR is usually under 1.5 over all three amateur bands. This degree of wide band low SWR is usually only obtainable if one is prepared to sacrifice some gain. The 10 m graph of Fig. 7 shows the double resonances (low SWR) caused by the coupling of the triband 10 m tuning and the 10 m short radiator.

Figs. 8, 9 and 10 show in more detail the forward gain (solid lines) and the front to back ratio as backward radiation (dashed lines). Especially in the case of the 10 m and 15 m graphs we see that the shape and frequency dependence of the gain, SWR and backward radiation curves are all different. It is typical for all beams that the best f/b ratio is sharper than the gain resonance.

The energy loss of the reference dipole caused when placed on the test mat, replacing the beam, can again be seen from the graphs.

The tested HB35C beam was correctly made, so that no changes were required after the beam was assembled following

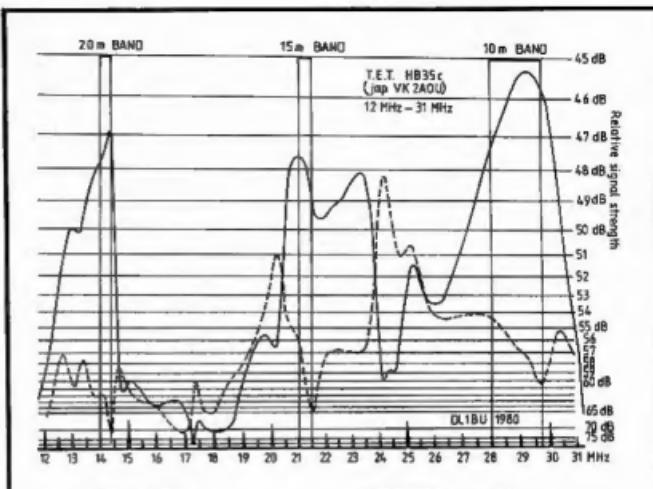


FIG. 4: Front to back tests. Full line forward signal, broken line reverse signal, HB35C antenna 15m above ground.

the instruction. This beam behaved identically to the one VK2AVA tried. Many DX tests were made between VK and DL and other countries in recent months. There was on 20 m no clear difference between correctly aligned P-5 antennas (like the one at VK2AOU or DF3FS, etc.), full size 4 element 20 m yagis (DL1KB) and 5 element log periodic yagis. The difference in received signal on 21 MHz and 28 MHz depended more on the antenna location and transmitter power. Under similar conditions, especially on 10 m, the gain was down by about 2 to 3 dB compared with other 3 element antennas. 2-3 dB can be had by adding 2-3 more elements, doubling the length of the antenna boom, or by doubling the transmitter power. With the SSB signal going through a 14 dB fluctuation from average to voice peaks, and adding several 6 dB S-units of fading, and the inaccurate mini S meters most receivers have these days, it becomes just about impossible to observe a 3 dB gain reduction between several antennas during DX communication. Most of us have to accept several times

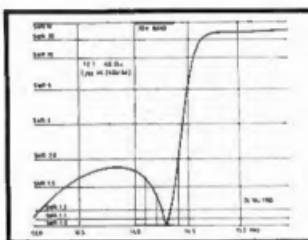


FIG. 5

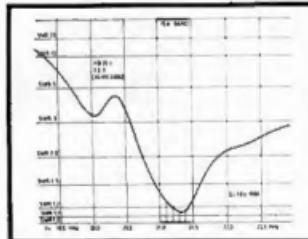


FIG. 6

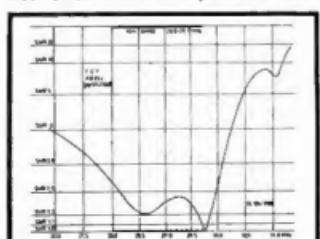


FIG. 7

this gain loss due to an unfavourable antenna location. Having no free hill top position costs several S-points of true 6 dB. Buildings with horizontal metal structures (mains wires, gutters and power lines along the street) are responsible for the fact that not "the antenna is the best RF-amplifier" — often stated — but the antenna mast location deserves this No. 1 title. Antenna gain and PA power may be

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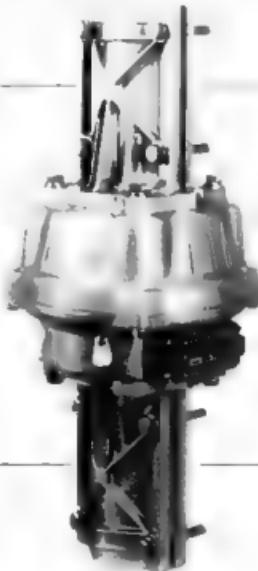
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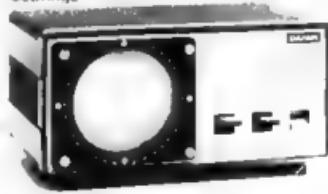
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rated about equal as No. 2 and No. 3. The ionosphere and the operator's voice frequency range are other important factors we have to accept.

It will be appreciated that the test results DL1BU published did perhaps not surprise professional antenna experts, but many hams have not been brought up on a diet of truth in this field, and they found it hard to swallow the facts and to give up cherished beliefs.

APPENDIX

Owners of a receiver, which has a 10 or 20 dB RF attenuator, can quickly test whether the S-meter is correctly indicating 6 dB S-units (2 to 1 voltage changes). One tunes in a stable signal of S-5, S-9 and S-9 plus 20 dB indicated. Next, one switches the attenuator in at each signal level. One will most likely find that at S-5 indicated the S-units have only 1 to 3 dB and at S-9 plus the S-units may have 10 or more dB. Therefore this sort of receiver and S-meter is quite unsuitable to compare signals and antenna performance. The Technical Department of the DARC (DL1BU) tested a number of receivers and transceivers, and the UV values which correspond to the indicated S-meter reading are listed in Table 1. The results deviate greatly from the IARU recommendation (proposed by VERON and RSGB), which were also published recently in AR-VK.

The following two graphs (Fig. 11 and Fig. 12) show what any yagi type beam will have to look like for the desired forward gain:

ACKNOWLEDGEMENT

The honorary Technical Officer of the DARC, Dipl. Ing. Gunter Schwarbeck DL1BU, who is a manufacturer and recognized expert on field strength equipment and a home brewing ham since his early schoolboy days, conducted during the last two years an antenna testing programme. The results were published in the German CO-DL magazine under the heading "A walk through the antenna forest!" His equipment comprises SWR measuring apparatus MP 778-D, network analyser ELKOM NA 900A, calibrated SWR test resistors, vector voltmeter HP and other valuable gear a ham can only dream of. There is a large antenna test field which is very level, on which stand five masts of various heights for DX testing. The antenna test range goes across a steep sided valley over a distance of 225 m and further 3 masts (some hydraulically) are to be found here. In addition DL1BU made so far 30 405 MHz model antennas which can be tested under free space conditions (no earth reflection effects). The writer appreciates very much the permission from DL1BU to use his test results for this test report in "AR".

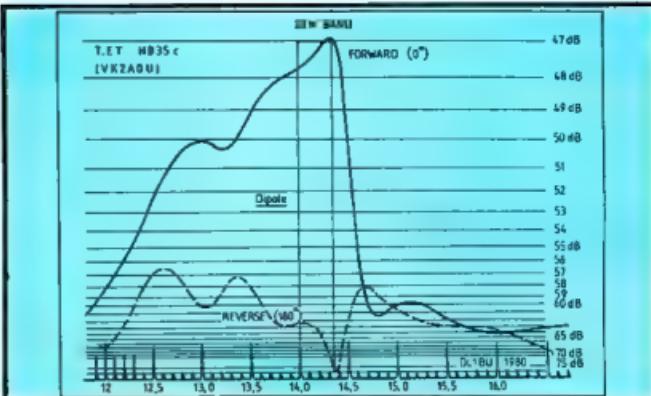


FIG. 8

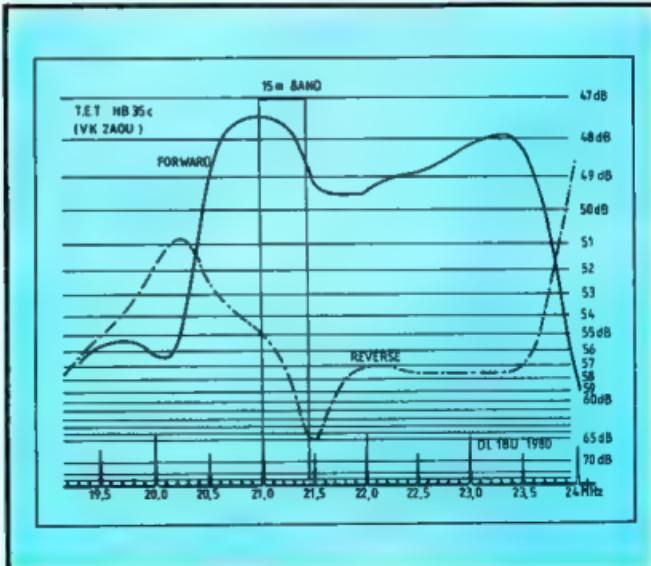


FIG. 9

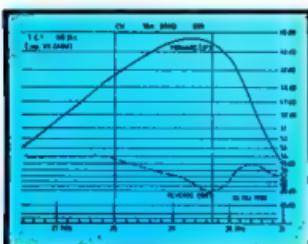


FIG. 10

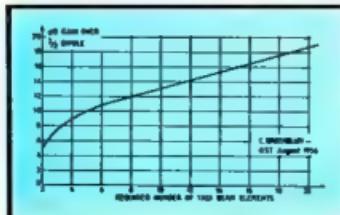


FIG. 11

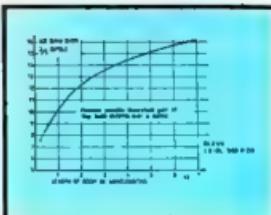


FIG. 12

TABLE I

Summary of various S meter calibrations. Note that variations in sensitivity occur from one receiver to another even if they are of the same model. The shown values must not be construed as representing any other set apart from the one tested.

Receiver Type	S meter readings												Test MHz
	S 1	S 2	S 3	S 4	S 5	S 6	S 7	S 8	S 9	+10 dB	S-9 +20 dB	S-9 +40 dB	
FT-901	0.8	0.9	1	1.2	1.4	2	3.3	6	11	50	200	1700	3.5
TS-820	0.5	0.7	1.1	1.7	3.4	6	12.5	25	50	200	1000	2200	14
IC-701	1.9	2.3	2.7	3.3	5	8	12	20	30	—	120	930	14
SB-104	10	18	2.8	40	52	68	95	125	170	265	460	1000	7.05
TS-520-S	0.55	0.7	0.92	1.25	1.9	3	5.6	12	25	110	500	1500	3.5
FT-301	1.4	2.4	4	7	10	13	18	24	30	95	450	2700	3.5
FR-101	—	0.4	0.48	0.63	0.9	1.4	2.4	5	15	150	1500	65000	—
C-245-E	0.26	0.37	0.5	0.68	1	1.6	3.2	7	13	—	130	1000	144
IC-211-E	0.33	0.56	0.73	0.87	1	1.2	1.45	1.9	2.5	—	8.5	50	144
Sony CRF-320	0.6	0.95	1.4	2.3	3.9	10	42	1000	>20000	—	—	—	3.5
FT-220	0.8	0.9	1	1.1	1.2	1.35	1.6	9.3	5	—	—	—	—
FT-221	0.75	1.2	1.65	2.15	2.7	3.5	4.4	5.9	8.2	17	43	180	—
IC-201	0.36	0.53	0.66	0.85	1.1	1.4	1.7	2.4	3.5	—	19	140	—
Multi-2700	0.29	0.37	0.41	0.44	0.47	0.51	0.55	0.64	0.8	—	—	250	—
TS-700-G	0.62	0.7	0.76	0.86	1	1.3	1.8	2.8	6	—	600	2000	—
FT-7	1.5	3	4	6.5	11	15	21	28	40	—	180	1800	7
IC-280-E	0.9	1.7	2.1	2.4	2.8	3.2	3.6	4	4.5	—	7.2	24	144
IARU Recommendation	0.21	0.4	0.8	1.6	3.2	6.3	12.6	25	50	160	500	5000	up to 30 MHz
IARU Recommendation	0.02	0.04	0.08	0.16	0.32	0.63	1.26	2.5	5	16	50	500	above 30 MHz

A larger War-Time Transmitter

A. R. Dexter VK5DL
37 Adelaide Terrace St. Marys 3042

This Philips type SVC 100L/110 is my main transmitter. These transmitters were built in Australia for the US Navy towards the end of World War 2. It is described in the manual as "semi-portable" with a weight of 525 pounds! The cabinet size is 25 inches high x 35 inches wide x 21 inches deep. In addition, tubular steel legs were provided.

The frequency coverage is continuous from 1.9-21.5 MHz in six switched ranges. The unit is completely self-contained from its AC mains power supply right through to its Z-match antenna tuning circuit. The valve line-up is — oscillator, 6V6, doubler, 6V6, keyer, 6V6, doubler, 807, driver, 807: PA 813. Although CW is the principal mode of operation, provision is made for MCW or AM using grid modulation of the 813 by a 6V6 which acts either as an audio oscillator or as a microphone amplifier respectively. There are three switched powers giving inputs to the 813 of about 75, 175 and 250 watts on CW. Of course



Philips type SVC 100L/110.
The drive can be reduced to give the desired 150 watts for amateur use.

The transmitter is constructed to extremely high standards. All RF components are silver plated and have ceramic insulation. The tuned circuits are very high Q having massive coils. A calibration chart dated 1947 is still correct in 1981. Servicing is easy as the transmitter is con-

structed as 6 plug-in modules. The steel front panels are engraved. It is said that these transmitters cost £1200 to make — a lot of money in the 1940s!

It is not known how many of these magnificent transmitters were built or what they were used for. This particular example has serial number 27 on the case and serial number 21 on the power supply. Philips Telecommunications Ltd at Clayton, Victoria, made a valiant effort to trace this model through their old files, retired personnel, etc. However, they could find no record of it ever having existed. I would be most interested to hear from any other owner of an SVC 100L/110 or from anyone else who knows anything about the history of the classic transmitter. ■

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Crowbars and SCRs

Denzil Roden VK2BXF

7/168 Herring Road, North Ryde, N.S.W. 2113

Correspondence received, following publication of the "Even Simpler Regulator", in the January 1980 issue of AR, apart from indicating a high degree of interest, also highlights a need for more information on SCR principles and their application as crowbar overvoltage protectors.

Silicon controlled rectifiers, otherwise known as Reverse-Blocking-Triode Thyristors, are more commonly used in power control applications, such as: motor speed regulators and light dimmers. The "reverse-blocking" refers to its inability to conduct during the negative half cycle of the AC mains supply.

First things first, a crowbar is a protective device and normally does nothing, apart from draining a few millamps from the supply. In the unlikely event of the regulator suffering a catastrophic failure, the SCR turns ON very fast, short-circuiting the power source. This has the result of pulling the voltage, applied to the equipment, down to a safe level very quickly and then after a few hundred milliseconds, of disconnecting the power source completely by blowing the fuse. Rather the same effect as placing a crowbar across the supply terminals — hence the name.

Use of SCRs in crowbar circuits is a very elementary application and I do not intend to delve more deeply into theory, than is necessary, to provide a working knowledge for amateur constructors.

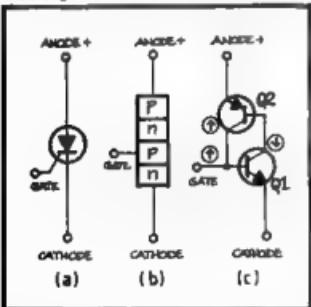


FIGURE 1

PRINCIPLES

The graphic symbol of the SCR is shown in Figure 1a, where the "diode" symbol indicates the reverse blocking characteristic and the gate suggests a controlling influence.

For crowbars, we are only concerned with forward conduction, with positive potential applied to the anode and zero volts, to the cathode.

A hypothetical representation of the inner junction structure is given in Figure 1b, showing the three p-n junctions and the reason for its general classification as a four-layer semiconductor device.

Since most of us are familiar with bipolar transistors, it makes operation of the SCR easier to understand by relating Figure 1b to its equivalent circuit, made up of interconnected p-n-p and n-p-n transistors, shown in Figure 1c. Where the cathode n-region is the emitter of Q1, the gate p-region is the base of Q1 and collector of Q2 and so on.

With the gate open circuit, Q1 is turned OFF and Q2 base current will be restricted to leakage, so Q2 will also be OFF. Under these conditions, with the anode-cathode voltage equal to 13.8V, the SCR leakage current is much less than a microamp.

For the SCR to "fire", the gate voltage must be increased until the gate-cathode junction is forward biased.

The gate parameters, of which VGT is the minimum gate-cathode voltage which will produce the gate trigger current and IGT is the minimum gate current necessary to switch the SCR ON, are usually specified as maximum values which guarantee turn-on of any device. For individual devices, VGT can be anywhere between 0.2V and 5V in extreme cases. Since we will be "calibrating" each crowbar, we are not concerned with what the exact trigger levels are.

However, with reference to Figure 1c, as the gate-cathode voltage is increased, a point is reached where Q1 turns ON. The interconnection of Q1 and Q2 producing positive feedback and regeneration as indicated by the polarity arrows, as follows:

As Q1 base goes positive, its collector goes negative, causing increased base current flow in Q2. The phase inversion of Q2 causes its collector to go positive, boosting the original rise in trigger current.

The result being that Q1 and Q2 turn each other ON, to saturation point, very quickly and will remain turned-on, even after the triggering voltage has been removed.

With the triggering voltage removed, the only way to turn the SCR OFF is to either remove the anode voltage or to reduce the anode current to below the specified "holding current", IH, which ranges from 20 to over 100 millamps for various types of SCR. So long as not less than IH is allowed to flow, the SCR will be "held" in the ON state.

So an SCR is really just a semiconductor switch, which may be likened to an electrically latching relay. In that, it will remain ON for as long as the supply voltage is applied.

RATINGS

In our crowbar application, the SCR will remain turned-on only for as long as it takes to "Pop" the fuse, just a couple of hundred milliseconds, during which time the anode-cathode voltage will be only a volt or less. Since this voltage was the source of triggering current, that influence is, of course, removed.

The forward ON current is the only SCR parameter for concern in our application and is specified in two forms:

ITM(RMS) is the current the device can pass continually with suitable heatsinking together with due regard for the maximum power rating of the particular device. The figure is 16A for type C164D and 35A for C228.

ITSM, the peak surge current, is a momentary rating and is usually specified for a time duration of one cycle at 60 Hz. For C164s it is 160A and 350A for C228s.

The form of specification of the latter is hardly relevant to crowbars and in fact the fusing current may be less than ITM(RMS) but it could sit somewhere between the two parameters.

In practice, type C164s work well for power supplies of up to 10A capacity, while C228s will accommodate regulators up to 30A.

MOUNTING CONSIDERATIONS

Power dissipation is no real problem because normally (we hope) the regulator will be functioning correctly and the crowbar will have nothing at all to do, so the SCR will be cold. Only in the event of a component failure will the SCR turn-ON and momentarily, will generate heat even then not enough to warrant more than a very small heatsink, not more than two square inches in surface area.

On the subject of heat, a major disadvantage of the SCR is that its gate sensitivity, or triggering level, is affected by temperature variations. For this reason the device should be mounted away from energetic heat sinks.

The mounting stud of the type C164 forms the anode terminal and is connected to supply positive, therefore must be insulated from other metal work, connected to supply common insulators are not easy to obtain, not being supplied by the more common vendors, but can be had from more professional sources such as George Brown in Sydney.

To save a lot of hassle, I prefer to use the type C228E(3), available from Silicon Valley, to name one source. The "3" suffix indicates that the mounting stud is isolated electrically, thus eliminating the need for insulation. (The additional cost of insulators equals the cost difference of the two types anyway.)

Isolated stud devices are recognisable by a third solder lug at the top, connected to the shell (anode).

The "E" suffix can be any letter and indicates the maximum working voltage and ranges from 60 V to 800 V, so is not relevant in our 13.5V application.

Some trouble has been experienced with some SCRs showing various "in-house" markings with the occasional intermittent gate terminals.

So, for those two reasons, the type C228E(3) could be the best choice, in addition, it has a higher rating.

Wiring to the anode and to the cathode should be sufficiently heavy to carry the fusing current as was explained in the original article.

CALIBRATION

Because of the wide spread of actual triggering voltage levels between particular devices, together with the tolerance spreads in 12V zener diodes, it is necessary to select a value for resistor R9 such that the crowbar will "fire" if the regulator output exceeds 15V.

The 15V threshold is chosen since it is the plus ten percent tolerance, normally specified for "mobile" amateur equipment, but any other "firing" level may be chosen to suit a particular need.

Variation of the value of R10 has almost no effect on the triggering level, since SCRs are current operated devices and at the point of triggering the current in R10 does not change to any significant extent. At that point the gate-cathode voltage is about one volt.

The gate bypass capacitor C5 absorbs voltage transients which might otherwise cause false triggering, such as might occur at normal switch-on, one or two microfarads will do as the value is not critical.

The test circuit is shown in Figure 2 and can be built up in its final form, with the exception of R9. The actual regulator can be used as the variable voltage source, if a variable resistor of a couple of hundred ohms is connected in the common lead of the regulator IC. When set to minimum resistance, the voltage will be the design value (13V) which can then be increased to test the crowbar, a 10MF capacitor across the pot will reduce ripple on the output.

It is not necessary to have a high current power supply in order to set-up a crowbar, nor is it necessary to spend a bag of fuses to achieve that end!

All that is required is a voltage source, variable between 13V or less, up to about 16V and capable of supplying 30 millamps or more. A unit having adjustable current limiting is suitable, but not indispensable.

Where only a high current supply is available, it can be used with the inclusion of RL (1 k-ohm, 1/2W), which will limit the SCR current to about 20 millamps.

The meter (M1) indicates the triggering voltage and if RL is used meter (M2) indicates when the SCR has fired. Alternatively, the LED lamp may be connected in series with RL, making M2 unnecessary.

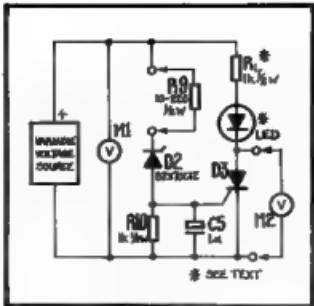


FIGURE 2

Another way, shown in Figure 3, is not to connect the SCR anode to the supply at all, but to use an ohmmeter to measure the change in SCR resistance, which, in the OFF state, will be several hundred k-ohms, or a couple of hundred ohms or less when turned ON. Be sure to connect the "Black" meter lead (battery positive) to the SCR anode. Depending on which ohms range is selected, 1kH may, or may not be exceeded, but it is the change in SCR resistance indication that matters.

So that is all there is to it, increasing R9 will raise the triggering level. The normally available value increments . . . 68, 82, 100, 120, etc . . . will allow precise enough adjustment, the actual value can be between 10 and 220 ohms.

Be sure to omit RL in the finished assembly!

The circuit shown in the original article was suggested to allow ease of inclusion in existing power supplies. The preferable connection point for the SCR anode is immediately after the fuse, F1, as shown in Figure 4. Connection after the regulator is satisfactory, since regulators do not fail by half measures, so the failed components will not impose significant impedance on the fusing current.

TESTING SCRs

The state of serviceability of an SCR can be tested quite easily, using an ohmmeter.

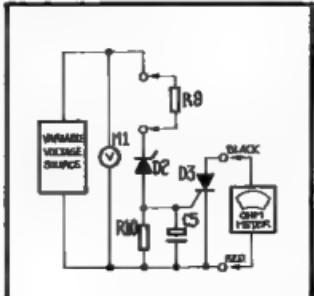


FIGURE 3

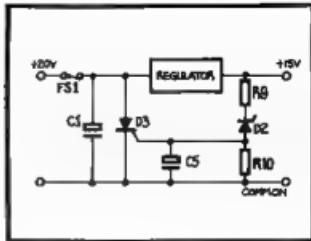


FIGURE 4

With the gate disconnected, the anode cathode resistance, in both directions, is several hundred k-ohms. With the ohmmeter battery positive, connected as in Figure 3, the SCR resistance will drop to a hundred ohms, more or less, when a resistor of around 100 ohms is connected between anode and gate. The SCR will remain in the ON state if the ohmmeter internal resistance can support 1H. ■

EDITORIAL IN AUTUMN '81 ISSUE OF "LYREBIRD"

Does anyone honestly believe that the privileges and facilities enjoyed by Australian Amateurs could have been won by individual and unorganised efforts of single amateurs or separate clubs? The WIA has, without question, contributed tremendously in presenting our cause to the highest authorities and achieving official recognition which has enhanced our hobby and kept at bay, thirsty frequency-grabbing claim-jumpers. Our Government Departments, like their counterparts in other countries, are accustomed to dealing with recognised representative bodies. They certainly will not deal with individuals in matters of general policy. It is regrettable that there are some who rightly or wrongly are critical of, and won't support, the WIA for a variety of reasons. These people, however, are quite content to enjoy Amateur privileges which some seem to imagine are god-given rights. Younger and less experienced Amateurs do not fully realise what they owe to the WIA on their behalf. Surely it devolves upon us, who have enjoyed our hobby for many years, to set the example and do what we can to back the only authoritative association which can fight for us. ■

QSP

AR GOING PLACES

AR is certainly going world-wide — a typical example is the reprinting by reciprocal arrangement in "Radio 23" (Journal of South Africa Radio League) of the article by Ralph Holland VK2ZB, "Audio Activated Saturating Switch" which appeared in our August 1980 issue.

We have also agreed to requests for various article reprints from Ham Radio and 73 magazines. Radio Communication, QST and Break-In have reciprocal reprinting rights also.

You never know where "your" article may show up next. ■

VK2TTY News – An Insight

S. E. Molen VK2SG

13 Pendle Way, Pendle Hill 2145

Have you ever wondered how the VK2TTY news started, or even who started it and why? Well let me tell you some of the history of the news broadcasts, and how they arrived at what they are today.

About four or five years ago there were only three RTTY stations in Sydney, VK2EG, VK2KM and VK2SG. There were others in other States, especially VK3 and VK6 as well as VK5. At this time there was a shortage of machinery. But fortunately some machines became available, and as there seemed to be little interest in them they were grabbed by the above three, cleaned, made to work, and put in the shack for future use.

Some visitors to these shacks were fascinated by machines printing overseas stations as well as various press stations. A few people were seen leaving various shacks with model 15c under their arms, and bits of paper in their pockets with circuits drawn on them! After weeks of sweating over hot soldering irons, noises started to appear on the air, and phone calls were made asking for test signals to be transmitted. VK2SG happened to be one of the chaps who had time on Sundays to radiate signals, and so most Sundays RYRYRYS appeared on the air from his place. But after many weeks he became bored with sending RYRYRYS! One week he had received a good signal from the States with some information about a convention at the statue of the 'Wounded Boot'. That may seem to be a little odd, but it appears that in the US, there is a statue to Paul Revere's boot, which was wounded when he was a colonel in the American army. So the next time VK2SG was asked to send RYRYRYS, he finished up with the story of the 'Wounded Boot'. That went down well!

About this time some of us decided to see how many were really interested in RTTY and if it would be possible to start an RTTY group. So the next week after the RYRYRYS an announcement was made that there would be a meeting of those who were interested in RTTY. If my memory is correct, 143 people turned up at the meeting. That decided us to form the VK2 RTTY group. Also it was suggested that a broadcast be made every Sunday at 0030Z. Originally the call VK2SG was used, but after some problems about the use of VK2SG for broadcast purposes, the call VK2TTY was obtained from the Department, with permission to do the broadcast. And so the broadcasts started, one might say from a small start big things have happened. We think that the coverage that the news gets at the present is a big thing. It certainly seems to have a large viewing audience, and we try to present a good general coverage of news, both Australian and overseas. Of course, we are always looking for news from anywhere.



After three years or more of transmitting the news, one begins to feel that it is getting terribly automatic. Some people take it all for granted, and really don't think much about the gathering of the news. They possibly think that it all happens with ease. All the news is supplied, and all the news editor has to do is to put it together into some kind of form and present it. But I can assure you that it is not quite as easy as that (I wish it was). A fair amount of work goes into the gathering of information for the Sunday broadcast. Let me tell you how it all happens.

Firstly, approximately eleven news broadcasts are printed during the week, such as GB2ATG, W1AW, VK4RTTY and DL2TX. W1AW is the main news service that is watched, as they broadcast every day and change their news items from time to time. There may be some items in their broadcasts that would be of interest to Australian amateurs. At times, of course, even though they have interesting news, so we look further for items. This entails looking at the bands and seeing what the chaps are talking about, maybe that can be used, who knows? We watch several bands, usually 14, 21 and 28 MHz with 7 MHz for local news.

Don't imagine we prefer overseas news, we are very interested in local news as well, but we receive very little so have to depend on the overseas items. After all, overseas doings affect us here as well, and so could be of interest to Australians. One point here is that happenings in VK2 could be of very little interest for example to VK6. What we want is news of Australian general interest. Then, of course,

we have the DX news. Here again we watch W1AW for the phone and CW DX news, and use it because we feel some of our members appreciate DX information. Then there are the RTTY DX notes. At the moment VK2TTY is the only station in the world (as far as we know) that sends out RTTY DX information. This information is gathered off air from various parts of the world, from stations such as OH4BX, IBA4 DK3CU, K7BV, JA1ABC, JA1DSI and several others, all of whom are keen DX men and know who is doing what in the DX world. We, of course, return the compliment by telling them of activity in this part of the world, or news which they may have missed in this way we keep up with the latest DX doings, again because we feel that some members are interested in this side of RTTY.

Having gathered what news we can, we read it through to make sure that it is still interesting, then we edit it to fit without taking three pages to tell a one paragraph story.

After the news has been read and edited, it is put on tape. This is usually done about 2000 hours local time on Saturday so that if there is anything interesting from Europe on Saturday afternoon, it can be included as the latest news for the Sunday broadcast. Cutting the tape and correcting the spelling usually takes about two hours. It is then run through completely to check running time. Further editing may take place at this point, so that the tape will occupy 30 minutes. Usually the finished tape is fairly close to time and sent as originally typed. Then another look around the bands, if anything special is heard, a further bit of

The new generation of ICOM gear continues with the Mobile IC-730 HF All Mode Transceiver able to transmit 100 watts of RF continuously. The design of every detail has been carefully considered. Note how all the major controls are located conveniently for mobile operation!

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System: quad conversion superhet. Complete with IF shift control.
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AM: Less than 0.3uV for 10dB S+N/N
Selectivity:
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AM: 6.0KHz at -6dB, 18.0KHz at -60dB
Spurious Response Rejection: > 60dB

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* As at time of publication.

tape may become a stop press item on the Sunday broadcast.

So we have assembled the news, cut the tape, and we are ready for the broadcast. But what about the equipment? None of the equipment used by VK2TTY is owned by ANARTS but is all privately owned by one of our members. For instance, the usual operator of VK2TTY, VK2SG, radiates on 14090 and 7045 kHz simultaneously. This requires two transmitters and aerials. For 20 metres we use a Drake TR4C driving a Dentron MLA2500B linear, for 40 metres a FT107 driving a Henry 1KD-5. Yes, both are big linears, but considering that we are running 400 watts output on both bands for the broadcast period, one needs a linear that will run that output for the period without issuing smoke! I can assure you that they do not get too hot during the broadcasts (well, not too hot!). The two metre broadcast is picked up from 20 metres and re-transmitted by VK2ZXL, who has a very good signal. After the 20 metre broadcast, VK2TTY then transfers to 21095 kHz to broadcast the DX news for those interested. Even some overseas stations look for this broadcast. The signals used on 20 metres are the quad at 65 feet, and for the 40 metre broadcast the G5RV at about 50 feet. The broadcast is repeated on 3545 kHz at 0930Z in the evening, again using the FT107 and the Henry linear to the G5RV and running 400 watts. With this equipment we are apparently getting a good coverage around Australia. There are times, of course, when conditions are against us, and the coverage may not be as good as it should be. We have yet to work out how to beat these circumstances. By the way, the quad is usually pointed about Darwin, as it has been found over a long period to be the best direction, but we are always open to suggestions, provided that all stations now receiving the news will still receive it from the suggested beam heading.

"THIS IS VK2TTY. AS FROM SUNDAY 18th JANUARY 1981. FOR A TRIAL PERIOD, VK2TTY WILL BE RADIATING ON TWO FREQUENCIES IN THE 20 METRE BAND, THE SECOND TRANSMISSION WILL TAKE PLACE ON 14095 kHz WITH A BEAM HEADING WEST WHILE THE NORMAL TRANSMISSION ON 14090 kHz WILL MAINTAIN ITS NORMAL NORTHERLY BEAM HEADING. THE 14095 kHz TRANSMISSION WILL BE RADIATED (FOR THE PRESENT TESTS) BY VK2DGA, WHILE THE 14090 kHz TRANSMISSION WILL BE DONE BY VK2SG. THE TIME OF THE BROADCAST WILL BE AS USUAL — 0030 GMT

YOUR REPORTS AND COMPARISON OF THE TWO TRANSMISSIONS WOULD BE APPRECIATED, ESPECIALLY FROM VK5 AND VK6.

IF THE TESTS ARE SUCCESSFUL AND COME UP TO EXPECTATIONS, WE HOPE TO MAKE THESE DUAL TRANSMISSIONS A PERMANENT FEATURE, FOR THE BENEFIT OF OUR MEMBERS IN VK5 AND VK6. THIS IS VK2TTY"

At VK2TTY's present location, it is possible to change bands by operating the necessary switch. Any transmitter can be switched on or off without affecting any other transmitter level, nor is there any inter-action between transmitters. The audio from any one of four receivers can be directed to the demodulator and printed on either the VDU, model 15, or the model 14 tape perforator if required. This again is just a matter of selecting the correct switch associated with that receiver. The VK2TTY CW Identification is sent from one head of the model 14 tape distributor (which has three heads). This head has been modified to send CW at 15 w.p.m. The other two heads of the model 14TD are wired in such a way that it is not possible to run two heads at the same time, but on stopping one head the next selected head will immediately start and continue without any break in the continuity.

So, that is how the news is gathered, assembled, typed and transmitted. From one week to another about twelve hours are spent watching the various signals on the air to see what is interesting and what is happening around the world as well as in Australia. Maybe we miss things at times, but we try to do the best we can!

One last thought. We are always looking for news from anywhere. If you have sent us some, and we have not used it, you may not have addressed it to the broadcast officer, or it may be that it was of purely local interest, or it could mean that for that week we had a lot of news and we just could not use your effort at that time. We may use it later, if it still applies. It is not that we are not interested, we would be very happy if the news were all Australian, but with no news arriving we have to use what we consider the best available. Not all the happenings in the world get into the newspapers. Some, less important than others, may still be good news and we hope to use them before they are "dated".

So, please send us what you can to help us present an Australian news service, not VK2, or overseas. We have always strived, and will continue to present Australian news, but it is only with your help that we can present your news.

We hope that this has been interesting to you and has given you some idea of how the news arrives at your place on Sundays.



Two views of author and shack.

RFI — EMC — EMI — EMP — EME

Tony Tregale VK3QQ
Federal EMC Co-ordinator

Radio Frequency Interference — Electromagnetic Compatibility. Call it what you will! World-wide it is one of the biggest problems for everyone connected with radio and electronics.

Unlike big industry, the Amateur Radio Service is a non-profit making organisation and does not have large finance available with which to protect its interests. The main assets of the Amateur Service are: technical knowledge, responsibility, enthusiasm and a great interest in the continued well-being of the service.

In this, the year of the review of the Wireless Telegraphy Act, the WIA are taking a responsible attitude to the EMC problem by co-ordinating a response to the proposed new RFI legislation, as well as setting up an EMC Advisory Service, under the direction of the Federal EMC Co-ordinator.

The high-powered legal angle of basic legislation is perhaps, beyond the scope of the average amateur operator — we have to leave most of this to the legal "boffins"! However, I'm sure they will require lots of assistance with the "nuts and bolts". This is the area where all amateurs can help by sending constructive comments and suggestions through the National EMC Advisory Service.

EMC advice of a down-to-earth nature is available to all Australian amateurs through the National EMC Advisory Service. The main aim of the service is to ensure that all Australian amateurs have access to the best national and international EMC advice and technical information, at the lowest cost. It is intended that the service should complement and assist any existing RFI groups — not clash with them. Main direction is towards the newly licensed amateurs and those who have worked hard for their licence, but on the first press of the key are in trouble with RFI.

The service operates on a central data-bank principle, together with a pool of RFI specialist advisors in order to maintain a large selection of the best available data, the central file must be fed through the co-operation of all amateurs, in sending details and reports of any RFI problems or answers, suggestions, ideas and any general information in connection with EMC.

An information exchange will benefit all amateurs for "United we Stand and Divided we Fall".

Around Australia with Amateur Radio

Ron Jones VK2VND

6 Curtis Court, Caringford, NSW 2181

Early in 1980, nine of us decided to do a trip around Australia by road from Sydney, north and return. The party consisted of four wives and five males. Considerable planning was done by Dick Millers VK2NRM and his wife, Barbara. The vehicles to be used were a Ford F100 (Dick and Barbara), a Chrysler Galant Station Wagon (Dot and Norm Williams) and the balance of us (Patricia and Ron Prudames, John Armstrong and Joy and myself, Ron Jones VK2ND) in a Toyota Land Cruiser. A lot of work was done on the vehicles to get them ready, the F100 was set up with two radios, TS120V, and CB unit for communication with the road trains we would encounter. The Chrysler Galant CB only, and the Land Cruiser was set up with TS120V and CB unit.

A date was set, and Dick VK2NRM took off with his party of four on Sunday, 20th September, and made for Lightning Ridge, where contact was made with the rest of us back home on 80m that night, reporting that everything was OK.

I might add that five of us could only get six weeks leave for the trip, whereas Dick VK2NRM and his party had eight weeks leave.

A shed had been lined up for us back home to contact Dick and his group in two days time but to no avail. We received news by land line that approximately 60 km south of Kynuna (Qld.), with a temperature of 42 degrees, Dick met with disaster, a slow combustion fire started in the back of the F100 and Dick and Barbara only had time to get out of the vehicle before it was completely engulfed in flames—the only warning being that Dick couldn't see out of his rear vision mirrors and after walking to the rear of the van found it completely in flames. Dick shouted at Barbara to jump and all they saved from the fully equipped F100 was a cooler with two cans of soft drink and what they stood up in—thongs, tee shirt and shorts. The heat was so intense they could only watch the \$20,000 bonfire and do nothing about it.

Dot and Norm had been travelling some way ahead due to the horrendous dirt road and stopped at Kynuna to wait for Dick and Barbara, not knowing of their terrible plight. In the meantime a transport vehicle picked up Dick and Barbara and brought them into Kynuna. Here they got a lift into Cloncurry where the people of this town took them under their wings and showered them with good old Australian hospitality.

And now we find out what Amateur Radio is about.

Thanks to Richard VK4NOD—he contacted us back home with further news that everyone was safe and sound and that the four of them would be continuing



Dick and Barbara meet with disaster between Kynuna and Cloncurry.

on the trip around Australia and would wait for our group in the Toyota to catch up with them in Mt Isa.

We arrived in Mt Isa and met Dick and his group who were full of praise for what the local VK chaps had done in arranging matters. Dick at this stage had purchased a new Falcon Station Wagon for the balance of the trip but no radio.

So now we only had one radio, the TS120 in our Land Cruiser, to try and keep in touch with George Millers VK2VVO and Alf Barnes VK2CE, back home in Sydney. Contacts were made regularly either on 10 or 15 metres which cheered everyone up immensely. We continued on to Camooweal, then on to the Three Ways just north of Tennant Creek, and viewed the John Flynn Memorial. From there on to Katherine and Kununurra, south to Lake Argyle, which has a capacity nine times that of Sydney Harbour and is a fisherman's delight, then on to Halls Creek. Contact was made back home to Sydney again, to VK2VVO and VK2CE.

Local information was given to us after we had contacted Keith VK6KC at Kuri Bay and Jack VK6RJ at Broome, regarding the road condition to Fitzroy Crossing, and so on to Broome.

The people we met through Keith VK6KC in Broome were wonderful to us. I might add that he is stationed in Kuri Bay as radio operator there for the company he works for, and it's a pretty lonely spot. Thanks Keith!

We then continued on to Port Hedland, a very lonely trip, 600 km of nothing but

open spaces and only one place halfway in between called Sandfire Flats, which has petrol and a cool drink and accommodation if required. At Port Hedland we made contact with Brian VK6NBX, who we had spoken to from home in Sydney, so it was nice to hear a familiar voice.

Our next stop was to travel inland to Wittenoom and on to Tom Price. Now the country changes again, hills and hills of iron ore as far as one can see. Tom Price is a wonder—to think that a whole town can be built so far inland and look like any Sydney garden suburb. Throughout the whole of the open cut iron ore field radio is used exclusively by all the vehicles to control all operations. We then followed the railway line to Dampier, where the iron ore is taken by trains that have over 180 trucks on them, each carrying around 150 tons of ore.

At Dampier we were lucky to get in touch with Brian VK6NBX again, and also Wally VK6NCL and Jack VK6NXL, who are all in the Geraldton area, but more of these chaps in a moment.

Our next stop was to get to Exmouth and to contact a good friend Marty VK6FO, who is based there.

Again, this is what Amateur Radio is all about. To arrive on a chap's front door at 8.30 pm with a party of nine people in all, and to be welcomed in the way we were, and the following day to be given the VIP treatment that was extended to us—Marty, on behalf of everyone, thanks!



Tower Zero, U.S. Naval Base, Exmouth, 1274 ft. high, it has lift for two people inside. Centrepoint for all the rhombics.

Carnarvon was next on our list to see; one couldn't miss that large communications dish operated by OTC and through their generosity an inspection was arranged. One more for the books.



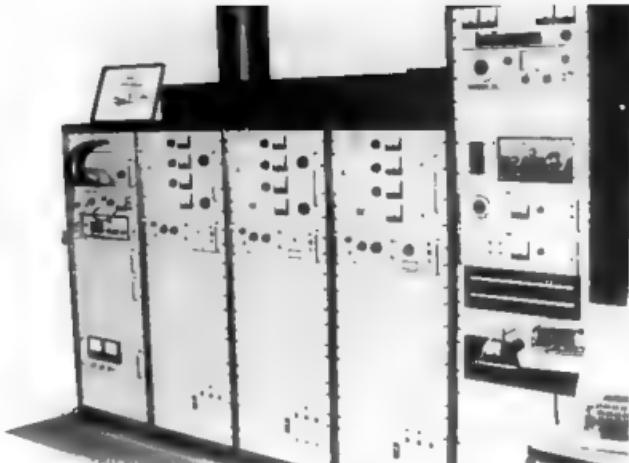
OTC dish at Carnarvon.

On to Geraldton, to be brought into town on 10 metres by our good friends Jack VK6NXL and Wally VK6NCL. Jack, we all thank you for that morning tea, you and your good lady. But Wally wasn't to be outdone we met him at the airport and Wally having the use of a Cessna 182, took everyone in our party for a flight over Geraldton district and coastline — absolutely the only way to travel, but one can't stop when one wants to.

Then everyone finished up at Brian's VK6NBX and his wife Rhonda's property for dinner. What hospitality!

On to Perth. Five days of rest here and everyone wishes we could have more time but we are only halfway around. Contacts still being made on 15 metres back home to Sydney, to VK2VVO and VK2CE

Down to Augusta, Albany and Esperance, and very little radio contact until we move north to Kalgoorlie and make contact with some VK6 and VK5 chaps. We visited the Flying Doctor base where I met Lorraine Winchcombe, who does a wonderful job, being the operator both for the base and



Flying Doctor base at Kalgoorlie. Transmitter and receiver



Lorraine Winchcombe (left) with nursing sister. Lorraine operates base and conducts the School of the Air.

the School of the Air — keep up the good work, Lorraine

We had been told that if we operated on the border of VK6 and VK5 an award was available from the VK6 radio club in Perth, so we set up camp just past Eucla and made contact on 80 metres with Bert VK6NPW, Con VK6PM, Bob VK6GD while we were right on the border. Thanks chaps (Award received)

Continuing across the Nullabor Plain, you find you are only a few kilometres from the ocean and the scenery is wonderful. From here we travelled down to Port Lincoln around the Eyre Peninsula to Adelaide, where we saw the city at night from the hills. From there on to Victor Harbour, up to Renmark, down the Murray River to Mildura on to Hay, Narrandera and back home to Sydney.

The total trip took six weeks (for five of us) and eight weeks (for four of us), we travelled 16 842 kms in that time and we saw some wonderful things in this country of ours and met some wonderful people, through Amateur Radio ■



The author (left) and Wally VK6NCL with his Cessna 182.

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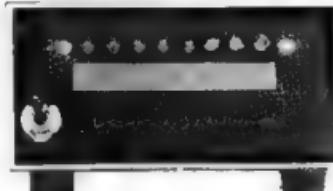
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Operation Whitestick

Len Childs VK3AKU
5 Trends St., Dandenong 3175

1981 is the Year of the Disabled and we have invited disabled amateurs to contribute articles.—This is the first:

Often, during a QSO with a new contact, I am placed in the position of having to say, "Sorry, but I am a blind operator". This invariably brings forth the comment: "Ah, you are a whitestick operator", together with a number of questions such as, "How do you cope, how do you find your frequencies, how did you get your licence", and so on.

This contribution will, I hope, help other hams understand just how we do cope.

My first contact with radio was in the early 1930s when, as a schoolboy, with the aid of an older friend, I managed to make my first radio gear, a crystal set, and acquired a little knowledge about radio in general.

During World War 2 I had some contact with radio used on aircraft and, after the war, owned and operated my own radio and electrical business for a short while. At this time I also attempted to get a ham radio licence but failed the CW. I therefore shelved the idea for the moment.

The reader may have gathered that I was not born blind but lost my sight late in life at the age of 55 and, as I'd spent a lifetime in electrical engineering, it was natural that when I reached sixty, the retiring age for my profession, I turned to radio to fill in my leisure hours.

The first thing, of course, was to obtain a licence. This was done by following the same general course as a sighted person. With the aid of a friend who was already a licensed operator, I attended night classes conducted by the local radio club. Not being able to read textbooks, it was necessary to have tape recordings for home study. Some of these tapes were already available while others were kindly produced by my friend. In all I used some sixty hours of tape in order to obtain the knowledge required to pass the examinations.

I learned CW in much the same way as a sighted person would with the exception that I had to start and journalise everything, right from the beginning.

Thanks to the co-operation and understanding of the Telecom Department and to the courtesy and kindness of its officers, I was able to undergo oral examinations in my own locality.

I managed passes in all sections and my appreciation goes to the supervising RIs for their understanding in my most nerve wracking experience.

I now had a licence. The next problem was to get on the air. So do I needed equipment. After much consideration my choice of equipment was a fully solid state rig which had the advantage of that, whenever the band-change switch was operated, the frequency zeroed back to the lower

edge of the band. This, with an analog tuning knob, meant that I could find any frequency on any band. The rest of the functions of the rig were very simple to understand and operate so having an ear accustomed to audio effects, signal reports, etc., came fairly easily to me.

It wasn't long, however, before just successful operation on air didn't seem good enough, and I realised that if I wanted to be on par with sighted hams with full knowledge of such things as SWR reading, power up the pole, etc., I would need aids to help me achieve this.

Enquiries throughout VK3-land showed that there was no group or club who had ever made a concerted effort to help the disabled amateur or disabled person who wished to become an amateur. Therefore I contacted some friends in the US who, through their channels, provided project material of this nature.

Having the material in hand, I then enquired if there were amateurs in my area who would be willing to help. There certainly were. I'm happy to say that, with their help, I now have some of these aids in actual operation, with others to follow. My sincere thanks go to this small group, for without their help I might have given up long ago.

These aids include an antenna tuning unit INDICATING AUDIBLY when an acceptable SWR reading has been achieved.

A talking frequency readout which consists of the voice board from a talking calculator interfaced with the visual digital readout. At the push of a button this device QUOTES VOCALLY the frequency appearing on the display.

An audio meter reader which can be interfaced with any meter or multimeter, giving an audible indication of the percentage of full scale deflection which the meter reads.

A 24 hour braille clock, in my case kept on GMT.

Audio light probe which gives an audible signal when LEDs, etc., are being checked and found glowing.

Other items which could be classed as standard have been manufactured for me.



The Author

These include power supplies, dummy load, etc.

As well as the above I also have literature on CW sounding frequency readout, audible multimeter and others which have not yet been evaluated. Information on any of the items mentioned is available to any interested person.

All other equipment used in my station is of a standard nature with the exception of a braille writer which I use for keeping my log and the antenna rotator indicator which has had its front removed so that I may follow the pointer by touch. QSL cards I write out with the aid of a slotted masking plate made for me by another one of those helpful hams without whose combined help I could not have reached my goal.

I often wonder how much easier it might have been if we had in Australia an organisation similar to the Handi Ham organisation in the USA.

And for my final final may I say that I am not truly a white-stick operator but more likely could be termed a Guide Dog mobile.

Good DXing. 73s.
VK3AKU signing, clear.



DX LISTENERS

April 1981 Issue of the DX Post received from the Southern Cross DX Club Inc of GPO Box 336 Adelaidia, S.A. 5001. A very well presented magazine for the broadcast station listeners and packed full of useful information and frequencies. Definitely a "must" for listeners interested in this field.

SIDEBAND ELECTRONICS ENGINEERING

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Our prices revert to normal on some items and we maintain our bargain prices on others such as ANTENNAS and KEN KR-400 ROTATORS. We also introduce some new items: Digital and Analog Multimeters, SWR, Power meters, etc. Why not try us? You won't be disappointed.

ANTENNAS

TET HB35C log/yagi	10-15 20M 13 boom	\$350
HY-GA N TH5 DX	yagi 10-15-20M 18 boom	\$370
CUSHCRAFT A3	yagi 10-15-20M 14 boom	\$250
HY-GA N TH3-R	yagi 10-15-20M 12 boom	\$215
HY-GA N 1B-AVT/WB8	10-80M vert. 25' tall	\$100
HY-GA N GPG-2	2M vert. 5/8W 3-4db gain	\$22
HF Helico wh ps	10-15-20-40M each	\$25
HF Helico whip	80M	\$30
SPEC AL PRICE	for set of whips w/bumper mount and spring base	\$120

MULTIMETERS - DIGITAL

DT-810 ..CD	readout 16 ranges colour coded	\$95.00
DT-820 LED	readout 16 ranges colour coded	\$75.00
CC-01 Carrying case		\$4.00
UP-11 HF Probe		\$3.00
UP-12 IC clip leads		\$2.50
UP-13 Universal test lead kit		\$5.00

MULTIMETERS - ANALOG

DT-1313	19 ranges colour coded	\$30
DT-1314	38 ranges colour coded	\$35
DT-1316	36 ranges colour coded	\$40

ACCESSORIES

CNA-1001	Daiwa 250W auto ant tuner	\$250
MK-1024	elect keyer w/programmable memories	\$195
H-MOUND HK-704	tear drop key	\$42
JACKSON CURRENT SENSING CAR BURGLAR ALARM		\$45
POWER SUPPLIES 240/13 8V DC		
2A reg. statd		\$35
5A reg. statd		\$55
6A reg. statd w/DOP		\$75

OVERLOAD VOLTAGE PROTECTION KIT	for 2 & 5A supplies	\$17.50
ASAHI TYPE bumper mount		\$6.00
STANDARD BUMPER MOUNT		\$3.00
TRANSFORMERS 240V/2 x 9V at 3.3A now		\$10.00
HD SPRING MOUNT w/SWIVEL BALL MOUNT		\$15.00
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COAXIAL 3-way push button switch		\$15.00
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MIC PLUGS AND SOCKETS 2, 3, 4 5 6 & 8 pin types available	Prices vary from	\$1-\$2
5-SECTION LP FILTER KENWOOD & SIMILAR	according to type	\$25.00
YM-37 YAESU 8 pin standard mic		\$15.00

ROTATORS	All rotators complete w/bottom mast bracket and for 28V AC operate	
CDE HAM-V HEAVY DUTY	brake pwr: 5000 in/lb	\$215
KEN KR-400 MEDIUM DUTY	brake pwr: 1300 in/lb	\$120

CABLES & BALUNS

RG-BU quality coax cable 50 ohm per metre	\$1.25
RG-58U quality coax cable 50 ohm per metre	.50
6 core rotator cable per metre	.75
BN-86 balun 50 ohm 1:1 1kW	\$25.00
HI-Q balun 50 ohm 1:1 1kW	\$15.00

TRANSCIVERS RECEIVERS ACCESSORIES

YAESU MUSAN, TRIO-KENWOOD and ICOM equipment available plus accessories. Ring, write or call in for information brochures and prices.	
KENWOOD TR-2000 2M all mode transceiver	\$580
KYOKUTO FM-2025A Mk 2 transceiver 2M FM10 memory 2BW scanning	\$340

SWR/POWER/FS ETC. METERS

JD-110 SWR/PWR/Fs black 1.5-144 MHz	\$15
JD-111 SWR/PWR/Fs (lat vel) 1.5-144 MHz	\$15
JD-140 Antenna matcher 100W 25-40 MHz	\$15
JD-171 SWR/PWR/Fs 1.5-144 MHz	\$20
JD-175 SWR/Fs/ant. matcher 1.5-144 MHz	\$25
JD-176 SWR/PWR/Fs/Matcher 1.5-144 MHz	\$35
JD-178 SWR/PWR/Fs/MOD/MATCHER 1.5-144 MHz	\$40
JD-181 SWR/PWR/Fs 1.5-144 MHz	\$15

MARINE TRANSCIVERS

2W 3 ch. hand-held w/crystals	\$70
5W 6 ch. hand-held w/crystals	\$105
BW 8 ch. mobile w/crystals	\$115

CONNECTORS

PL-259 RG-BU and RG-58U types each	75
SO-239 1/2 or 4 hole mount each	75
RIGHT ANGLE connectors	\$1.50
T-CONNECTOR 3 x SO-239	\$2.00
T-CONNECTOR 2 x SO-239, 1 x PL-259	\$2.00
PL-258 Double female 2 x PL-259	.75
DOUBLE MALE 2 x PL-259	.75
UG175/U reducer for RG-58U coax	.20
UG178/U reducer for RG-58U coax	.20
ADAPTOR RCA male to SO-239	.75
LIGHTNING ARRESTOR PL-259/SD-239	\$2.00
MLS RIGHT ANGLE PL-259 RG-58U	.75
GRL RIGHT ANGLE SO-239 to RG-58U	\$1.00
M-RING car body mount 2 x SO-239	\$1.00
UG363/U 2" feed thru D/F 2 x SO-239	\$1.50
CABLE PLUG for RG-213 cable	\$4.00
BNC CONNECTORS SILVER PLATED WITH TEFLON INSERT	
UGB8/U male in-line plug for RG-58U	\$2.00
UG1094/A/U panel mount socket	\$2.00
UG89/U in-line socket for RG-58U	\$2.00
UG914/U double male adaptor	\$3.00
UG491A/U double male adaptor	\$4.00
UG259/U BNC male to SO-239	\$2.00
UG273/U BNC female to PL-259	\$2.00

All prices are NET, ex Springwood NSW, on pre-payment with order basis. All risk insurance is free of charge, allow for freight charges by air, road, rail or post, excess will be refunded. Prices are subject to change without prior notice. All orders cleared on a 24 hour basis after receipt of order with payment.

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FORWARD BIAS

VK1 DIVISION

(Postal Address: WIA (ACT Division) Inc
PO Box 46, Canberra, 2600 ACT)

C. T. Vidler VK1KV
Hon Sec and Publicity Officer

REPEATER NOTES

The Mount Ginnini and Black Hill Repeaters continue to provide very good service, and this was particularly evident during the Easter weekend with a considerable amount of traffic being generated by mobile stations on the Hume and Monaro Highways as well as a large number of visitors to Canberra.

It is expected that these two repeaters will also provide their usual sterling service to travellers passing through Canberra on their way to the Snowy Mountain snow resorts.

Input frequencies to these repeaters are as follows —

Mount Ginnini: Channel 6350 (47) — 148.350 MHz.

Black Hill: Channel 6300 (46) — 146.300 MHz.

The Ginnini repeater is located about 40 km south-west of Canberra at about 5800 feet above sea level; and Black Hill is about 15 km west at 2800 feet.

Max VK2ZLX has advised VK1 members that it is hoped that the new Nowra area 2m FM repeater, Channel 7200 (76) will be placed in service on the Cambewarra Mountain, near Nowra, in about one month's time. Max reports that it is probable that with 38 watts out of an omni-directional antenna this repeater will be useable by VK1 2m addicts.

It is hoped that the Division's UHF repeater will be installed and operational before the onset of winter in the high country closes the road to Mount Ginnini.

AMATEUR RADIO CLASSES

Classes conducted by this Division are continuing at Melba High School.

While the number of students at the AOCP classes remains constant there has, fortunately, been a fall off in the number of students at the NAOCP classes. Maybe this only proves that it is difficult to conduct a "crash" course for the May exam in conjunction with a full course for the November exam. Anyway we wish the ongoing students good luck.

DIVISIONAL PROPERTY REGISTER

The Division's Committee is anxious to compile an up-to-date list of Divisional assets. The Property Officer, Fred VK1MM, has had a similar lack of success in locating a number of items, includ-

One of the missing items is of particular historic interest. This device, constructed mainly of brass, outputs CW by means of a rotating drum, pins and a punched paper tape.

If you have, or have seen, any of these items please notify Fred on 58 1354 (AH) or 72 2224 (BH).

It is not intended to recover all of these items but merely to record their locations.

NEW MEMBERS

The President, Committee and members of the VK1 Division are pleased to note the considerable number of new members who have joined the Division recently.

MONTHLY MEETINGS

The monthly meetings of the VK1 Division are held on the fourth Monday of each month in Room 1 (downstairs) in the Griffen Centre, Bunda Street, Civic. Doors open at 7.30 p.m. for QSL business, book sales and the usual technical talk.

These meetings are kept completely informal. Most evenings we have a speaker to address us on some topic related to radio.

Scheduled for an early date is a talk by one of the staff of the Air Traffic Control Tower at Canberra Airport. This talk will be, we hope, a preliminary to a visit to the Air Traffic Control Centre. (Sorry, fellas, but no "hands on" experience during this visit. Hi HI.) ■

VK2 MINIBULLETIN

COUNCIL REPORT

At its April meeting, Council welcomed Castle Hill RSL Amateur Radio Club to affiliation with the Division. Letters were received from three members complaining about interference from the Sydney Channel 0 TV test pattern. Council decided to write to SBS requesting that the Channel 0 test pattern transmissions be curtailed to allow daytime amateur operations on 6m. Two members in the Sydney area have volunteered as Intruder Watch reporters. Volunteers are still needed in country areas of NSW to ensure Statewide monitoring of commercial intrusions into our amateur frequencies. If you want to help preserve our bands and can send in reports on intruders, please write now to the Divisional Secretary, Box 123, St Leonards 2065.

Many thanks for recent donations to the Division's Tower Fund from A. Tilley \$20, Castle Hill RSL ARC \$5 anonymous \$5, Hornsby ADARC \$30, Blue Mountains ARC \$20, J. Spencer \$10, T. Mills \$25, S. Pall \$20, J. Pages \$20, R. Fockett \$25, A. May \$30, Wagga ARC \$32 and N. Turner \$10. The fund now (1/5/81) stands at \$592 with a target of \$2,000. If you would like to donate to this fund, please send cheques made out to the WIA to Box 123, St Leonards 2065.

The seven Divisional Councillors will hold the following positions on Council for 1981/82: Athol Tilley VK2BAD, President, Affiliated Clubs Liaison; Susan Brown VK2BSS, Secretary, AR sub-editor, publications; David Thompson VK2BDT, Treasurer, 2nd Vice-President; Tim Mills VK2ZTM, 1st Vice-President, WICEN, Repeaters and Beacons; Stephen Pall VK2VHP, Education, New Membership, Henry Lundell VK2ZHE, Technical and Property Atchison Street Jeff Pages VK2BYY, Broadcasts, Property Dural. In addition to Council positions, the following people were also appointed: Correspondence Course Supervisor, Cec Bardwell VK2IR; Technical Dural, Roger Henley VK2ZIG; Slow Morse Supervisor, Mark Salmon VK2LDI; Library Officer, Bill Hayes VK2AJL; Education Service Supervisor, Ken Hargreaves VK2AKH; WICEN State Supervisor, Howard Freeman VK2NL, WICEN Committee, Michael Richter VK2BMM, David MacKey VK2ZMZ, Neville Wilde VK2DR, Arthur Giles VK2ZGA, Christo Simeonoff VK2ZAX, Sidney Griffiths VK2AHF, and Eric van de Weyer VK2ZUR; Dural Committee, Doug Morison VK2ZYM, David Walters VK2AYO, Phil Cole VK2BQC, Charlie Walker VK2BX.

Volunteers are still needed for the Repeater Committee, Intruder Watch and AR Publicity Officer. If you can assist, please write to the Divisional Office.

At the April Council meeting, Stephen Pall presented ideas on proposed activities to celebrate the 75th anniversary of the

A Call to all holders of a **NOVICE LICENCE**

Now you have joined the ranks of Amateur Radio, why not extend your activities?

THE WIRELESS INSTITUTE OF AUSTRALIA (N.S.W. DIVISION)

conducts a Bridging Correspondence Course for the AOCP and LAOCP Examinations.

Throughout the Course, your papers are checked and commented upon to lead you to a **SUCCESSFUL CONCLUSION.**

For further details write to:

THE COURSE SUPERVISOR, W.I.A.

P.O. BOX 123,
ST. LEONARDS, N.S.W. 2065

WIA in 1985. If you, as a member, have any ideas on how the oldest amateur radio society in the world should celebrate its 75th anniversary, why not jot them down and send them in to Council?

As crack night is a week earlier this year, the original date chosen for the next Divisional auction clashed with the VK2WI fireworks night at Dural. The auction has been postponed to Saturday, 27th June, at 1 p.m., 14 Atchison Street, Crows Nest. Items from members for auction will be accepted between 10 a.m. and 12 noon on the day of the auction.

As from the AGM of 28th March, Articles 82 and 48c of the NSW Division's Memorandum and Articles of Association have been deleted and replaced with the following:

82 Any club whose membership includes in part or whole five (5) or more Ordinary Members of the Division having a common bond, either by reason of geographical affinity, or mutual purpose of interest, or otherwise, may affiliate and operate within the framework of the Division.

48c Be forwarded to the Office of the Division at least thirty (30) days prior to the date of the Annual General Meeting.

DURAL REPORT

The new studio facilities are nearing completion thanks to the efforts of Doug VK2ZYM and Reg VK2ZCK. By the time you read this, the broadcast should be originating from Dural on a full time basis. If you would like to volunteer as an engineer or news reader for the Sunday broadcasts, contact the Dural Secretary. Volunteers would be rostered on a two/three monthly basis.

Transmissions are now provided from Dural on 5 and 2m SSB, the frequencies being 5212 and 144.12 MHz. The transmitters used on these frequencies, which were built by Jeff VK2BYY, have a common exciter and feed approximately 10W PEP into the beacon antennas. Consequently, the Dura beacons will be off air on Sundays between 10.45 a.m. to 12 noon and 7.15 p.m. to 8.20 p.m. The 10m beacon is now operating on its permanent frequency of 28.262 MHz using A1 (CW) identification. The 2m beacon will be moving to its assigned frequency later this year.

VHF MOBILE TRANSCEIVERS

The NSW Division has for sale to NSW members a quantity of the following units:

- 1 AWA MRT 25As complete, less crystals.
- 2 AWA MRT 25As, incomplete, less crystals.
- 3 Pye MVF 516s, complete, less crystals.
- 4 Pye MVF 516s, incomplete, less crystals.
- 5 TCA Type 1675s, complete, less crystals.
- 6 TCA Type 1675s, incomplete, less crystals.

Complete units are \$10 each, incomplete \$6 each. This price includes packing and rail freight to nearest railway station. Goods are for sale to members **ONLY**, for amateur use **ONLY** and are not for resale. When

placing your order, please specify first, second and third preferences in case your first choice is not available. Send cheques made out to WIA Disposals with your order. The offer closes on Saturday, 27th June. If there are more orders than units, a ballot will be conducted. Any units left over will be auctioned on June 27th.

Details of three Clubs affiliated with the NSW Division —



CASTLE HILL RSL AMATEUR RADIO CLUB C/- 16 Mills Road, Glenhaven 2154.

Meetings: 1st Mondays at Castle Hill RSL, Castle Street, Castle Hill. Classes Novice, Tuesdays, 7.30 p.m., at Castle Hill RSL Club.

President: R. Hudson VK2YVO/VKP, Secretary: C. MacKinnon; Publicity: P. O'Toole VK21ZO, phone 880 2112 AH Club call sign: VK2DCB



TUMUT AND DISTRICT AMATEUR RADIO CLUB

93 Lockhart Street, Adelong 2729 Meetings: Wednesdays, 7.30 p.m., Tumut High School.

Club is solely for tuition of persons wishing to learn radio theory and CW

President: K. Dodd VK2DLZ; Vice-Presidents: R. Weedon VK2PN (phone (066) 47 1026 Bus.), V. Nugent VK2ALZ; Secretary: E. Dean.

Tumut Club will be hosting the 1981 SWARS Convention in October.



BLUE MOUNTAINS AMATEUR RADIO CLUB

PO Box 54, Springwood 2777

Net Tuesdays at 8 p.m. on 3540 kHz using VK2AUX/NCM club call signs

Meetings: 1st Mondays, 8 p.m., at club room, Springwood High School, Chapman Parade, Faulconbridge (if public holiday 2nd Monday)

Classes: Mondays except club meeting night, Springwood High School

President: P. Willis VK2DAV; Vice-President: J. Dunn VK2VJD; Secretary: J. Belshaw VK2VPG; Other Committees: T. Ryeland VK2BRQ, E. Meine VK2ZRI, N. Walker VK2ZNN, D. St. Ruth VK2NQN Repeater VHFR 7050.

COMING EVENTS

6th, 7th, 8th June, Oxley Region Field Day at Port Macquarie. Write to PO Box 712, Port Macquarie, 2444, for a programme.

27th June (Saturday), 1 p.m., Divisional Auction at 14 Atchison Street, Crows Nest. Items for auction in before 12 noon.

Copy for inclusion in the VK2 Mini-bulletin must reach Box 123, St. Leonards 2065, two days before the end of the month prior to publication, e.g. by 28th June for August AR.

Susan Brown VK2BSB. ■

A small disadvantage of this column is that it lags by 28 days, that is, I have to have my copy in to the Editor about a month before the magazine reaches you. Most times we can tolerate this, or else study the crystal ball more carefully. For example, as I write this there's still about a fortnight before the Annual General Meeting of the WIA Victorian Division. I've got a very good idea of WHO will be on your new Council — so have the other nine victims, but who will be what? . . . now there's a question.

I did say victims, and I mean it! Obviously there may be some status in saying "I am a Councillor of WIA Vic Division", but I can assure you that the pleasure is often masked by the punishment. Let's face it — Councillors are fair game no matter what the organisation, and we amateurs are no exception to that game. Even the most apathetic amateur becomes a vociferous vigilante bent on his own trail of vengeance when he finds himself a Councillor to bloat!

If one retains normal sensitivities then one term in office is enough and someone else can have the job. At the other extreme you can become so "shellbacked" and insensitive that you are of no use to the system. There are very special exceptions — dedicated men like Al Noble VK3BBM, Keith Scott VK3SS and John Adcock VK3ACA, who keep on coming back for more despite the knocks because they care for you and your hobby. There are many more like these, but faceless and nameless heroes — the Broadcast group, the Repeater group, and all the other quiet people who dedicate their time and skills to improving the lot of Amateur Radio. A lot of their work is voluntary, undoubtedly some advanced and insidious form of sadomasochism! This is the International Year of the Disabled — in line with that may I humbly suggest that within our fraternity YOU make it the Year of the Volunteer and GIVE them your SUPPORT.

CRYSTAL BALL DEPARTMENT

I rather suspect that the general meetings of Vic. Division might undergo a change of character for the better. Contrary to the outspoken belief of an ill-informed few, the WIA is not in competition with the various clubs — there's an entirely different purpose in one compared with the other, although all share a common aim to enhance the hobby. Nevertheless it is quite difficult to formulate a GM that doesn't appear to be competitive with the clubs. Whispers I have heard suggest that future monthly meetings will be far more interesting in both Social and Technical aspects, and it is hoped to see a better attendance from the Novice ranks. Watch this space and the Sunday broadcast for further details.

Apropos of the above. I never fail to be astounded at the range of ideas which one hears expressed over the air, many in the form of, "If I was . . ." or "Why don't they . . .". Many of these thoughts have a good base and are capable of good results. Too many of these ideas cease to exist, once spoken. On paper it doesn't take much effort to change "whinger" into "writer" (especially if you misspelt whinger to start with!) If you hear, or have, a good suggestion why not write it down and send it to us — we'll sort the "wheat from the chaff" and will even correct your spelling mistakes. Come to think of it, the better ideas could even be presented in this column.

Is apathy one of the biggest threats to the amateur service in Australia?

The recent fight against Channels 0 and 5A and the submissions to the Committee on the Table of Frequency Allocations only received the positive action of a small percentage of amateurs. In both of the above cases there were even standard letters printed for your use — all you had to do was sign and send. Seems like even that was beyond the ability or interest of the average apathetic amateur.

The present anti-Woodpecker campaign needs the fullest support from all amateurs.

Many amateurs seem convinced that if anything is to be done about the Woodpecker, it will most probably be as a result of lobbying by CB operators. After all, CBers fought for legalization and won, then fought for retention of 27 MHz and won. In the 1980s the CBers seem to have the respect of the authorities because of their tenacious approach to serious matters.

Who knows, in the years to come they could successfully lobby to annex our 10 metre band — and they'd win because we're so complacent that we'd sit back and do nothing as usual.

Isn't it about time for us to "bite the bullet" and get off our collective seats to do something to show our government, and anyone else, that we do care? Most of us earned our amateur licence the hard way. Are you now content to sit back and see your facilities and privileges whittled away, or prostituted? If not, DO SOME THING NOW. Get stuck into that Woodpecker campaign for starters.

Seems like we really stirred up a hornet's nest with that comment in the April issue about the use (misuse???) of phonetics on 2 metres FM. One call holder even suggested that I change my name as a result, but I do prefer Peter to Richard — thanks all the same! I will admit to three situations where phonetics are justified, marginal operating conditions where copy is poor, to overcome a speech defect, perhaps, and finally that situation where the call sign could be mistaken for another because of similarity in sound, e.g. suffixes such as DMN and BNW. Having allowed for these areas, where does that leave the rest of my critics? For the most part I suspect

that many didn't read the item properly as I specified "on 2 metres FM under ideal communication and quality conditions". As a parting shot on the subject might I suggest that some of the "rapid but not readable" proponents of persistent phonetics should use their phonetics first, and then say the word or name clearly afterwards — this way we'll be able to work out what you said.

Back in the April issue you may also recall a letter from VK3KBA. One reader has been prompted to reply as follows:

Dear Peter,

In April's issue of AR you published a letter from VK3KBA. Does this mean that the correspondence between VK3NW0 and VK3ZFA will cease? Or that VK3KBA has become a multi (media) personality instead of a schizophrenic?

73. Ian VK3YIP

While yet another reader came forth with

Dear Sir,

I wish to complain about the excessive number of letters which have recently appeared in your columns regarding the Novice/Half-call controversy.

There is nothing wrong with half-calls; they are licensed amateur operators after all, but would you really like your sister to marry one?

There is a place in the system for the novice operator, too. True it hasn't been dug yet, but it is rumoured that the Institute is acquiring land in the country for that purpose.

At the risk of being hung, drawn and quartered, may I suggest that we close this quadrophonic subject at last?

Yours faithfully,

VK3XS.

Really Ian, what can I say? It's all been too much!

And on that note, dear readers, I'll wish you all 73 until next month.

Peter VK3JN.



NORTHERN NOTES

Meeting held at Bourke Street Club Rooms, 31 persons in attendance, including three new members. During the evening an auction was held. VHF gear to be auctioned was purchased from TNT9, the local TV station. Total takings were \$208.70 with a profit of \$21.70, which was forwarded to the Handicapped Aid Programme.

A major canvassing for recruits to amateur radio is being conducted by VK7Z through all forms of media.

SOUTHERN NOTES

None received as yet. Perhaps there may still be a postal strike in progress?

NORTH WESTERN

Congratulations on your recent exposé on amateur radio's many facets and history through your local newspaper "The Advocate". At the last meeting the guest speaker, Mr Matchpole of "The Advocate" newspaper, lectured on amateur radio and the media.

Jim VK7KOW has returned from New Zealand and I believe some experience with an old "Geyser" Romantic sm perhaps!

Gentlemen, young and old, you are welcome on the Sewing Circle net each evening, 80m, (0700Z), 3590 LSB. Personally I have found many interesting discussions on this net regarding antennas, the G5RV being number one on the checklist.

VK7AE, world-wide DXer and International net controller, is now back in action, minus many amputated fingers, but the VFOs still turn. A new 8 a.m. to 5 p.m. curfew has been imposed, plus overtime. Welcome back Andre.

AOCP class Instructions on entering and obtaining a certificate are now in progress at the King's Meadow High School, Leunceston. Late students are welcome. Contact Brian VK7ZBY at 44 1466

Until next month.

P.S.: Tasmanian Devils are plentiful, extinction of this rare species is forecast, so keep trying for those rare certificates and check all net frequencies weekly.

The Japanese amateur magazine "Mobile Ham" has recently exposed our efficient repeater system in Tasmania. Thanks for the report in March "Mobile Ham", page 157, De Ara VK1IBM

BOOK REVIEWS

QSO JA NOW

An introductory text on Japanese Conversation for Radio Amateurs

Congratulations to VK2AHB, Paul Roden-huis, for compiling the material in the book, and to Westlakes Amateur Radio Club for making the results of Paul's studies available to Australian amateur radio operators.

Many people recoil from the suggestion that the Japanese language is a learnable language, yet students of the language soon appreciate the logic of the structure once the initial jaw-breaking pronunciation drills have been mastered.

Success in any foreign language would surely depend upon the ability to speak the language, and in order to speak the language an important component is confidence. A confidence gained by trying making mistakes, modifying, then trying again.

There is no better way than being face to face with a teacher who can show by example the correct shaping of mouth for various sounds, and demonstrate the vital subtle differences of pronunciation which otherwise may be undetectable to the untrained ear.

If the book is to achieve the stated aim of encouraging communication between JA and English speaking amateurs, and if the communication is to be in part Japanese, then the hurdle of basic pronunciation must be overcome, probably by enrolling in a course of Japanese conversation.

Australian operators may be "spirit willing" but usually are "language lazy".

If the book does no more than create an interest in learning Japanese conversation then it is worthwhile. It is an attempt to do something positive and constructive for those whose particular interest is in that facet of amateur radio.

VK3BWX

SHORT WAVE PROPAGATION HANDBOOK

Edited by George Jacobs W3ASK and Theodore J. Cohen N4XX

Cowan Publishing Corp., 14 Vandergrift Avenue, Port Washington, NY 11050 USA.

This handbook discusses the principles of ionospheric propagation, sunspots and the sunspot cycle, sunspot cycle predictions.

ionospheric forecasts and unusual HF and VHF ionospheric propagation. Quite useful information for the old and new amateur.

Jacobs and Cohen are well known for their contributions to CQ Magazine and quite a few years' study has gone into the preparation of this handbook. Their original articles on short term forecasting gave me an insight into the vagaries of ionosphere propagation.

For those interested in acquiring a working knowledge of this little known area of communication technique, then this handbook is a good start. Some of the information applies purely to the USA, but most of its contents have a universal application and it is a useful addition to your reference library.

Available from Magpubs, \$7.50 plus postage.

VK3BYE

OSP

USE OF 52.650 MHz

Unfortunately several VK 6m operators still persist in using 52.650 (the national calling frequency) for non-DX contacts (i.e. across town) and effectively masking any international stations which now recognise this as the frequency to call on when looking towards VK. With recent conditions to Interstate, it has been noted that several O5Os appear at the same time on 52.650 MHz. Best is to call CQ on 52.650 and advise that you are going to QSY to 52.675 or so, well away from .650. — GARC Newsletter, Jan. '81

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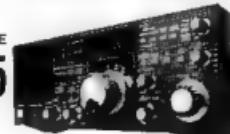
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VHF-UHF

AN EXPANDING WORLD

Eric Jamieson, VK5LP
Forreston, S.A. 5233

JUNE 1981

VHF/UHF BEACONS

Freq.	Call Sign	Location
50.005	H44HIR	Honiara
50.100	KH6EQI	Pearl Harbour
51.022	ZL1UHF	Auckland
51.999	YJ8PV	Vanuatu
52.013	P29SIX	New Guinea
52.150	VK5KK	Arthurton
52.200	VK8VF	Darwin
52.250	ZL2VHM	Palmerston North
52.300	VK6RTV	Perth
52.320	VK6RTT	Carnarvon
52.330	VK3RGG	Geelong
52.350	VK6RTU	Kalgoorlie
52.370	VK7RST	Hobart
52.400	VK7RNT	Launceston
52.425	VK2RAB	Gunnedah
52.435	VK3RMV	Hamilton
52.440	VK4RTL	Townsville
52.450	VK2WI	Sydney
52.500	JA2IGY	Mie
52.510	ZL2MFH	Mt. Cheeseman
52.800	VK6RTW	Albany
53.000	VK5VF	Mt. Lofty
144.010	VK2WI	Sydney
144.182	VK3RGI	Gippsland
144.400	VK4RTT	Mt. Mowbullan
144.475	VK1RTA	Canberra
144.500	VK6RTW	Albany
144.800	VK6RTT	Carnarvon
144.700	VK3RTG	Vermont
144.800	VK5VF	Mt. Lofty
144.900	VK7RTX	Carnarvon
145.000	VK6RTV	Perth
147.400	VK2RCW	Sydney
432.400	VK4RBB	Brisbane
432.450	VK3RMB	Mt. Bunningyong

No changes to the beacon list, but the Solomon Islands beacon on 60.005 has certainly been confirmed during April as being operational, having been heard on numerous occasions with signals at times over S9.

Beacon custodians are reminded of my requests over the past two months for information on your beacons please. So far nothing to hand.

SIX METRES

Well, the band certainly had everyone fooled! Following the rather poor showing during September/October last year, everyone hoped it would be in better shape during March/April 1981. March gave some hope for improvement, and early in April ZL TV was available from 2200Z onwards for at least a couple of hours most days, with signals good enough to provide pictures in colour most times, but without sound, the sound channel being higher in frequency the MUf often did not reach that high at that hour. The TV stations (often more than one) were watch-

able on at least 11 occasions here, and noted to be there on a further 5 occasions, and confirmed on the PRC10 receiver on 45.250.

6/4. JA7 and JA8 0500 to 0530Z. On 10/4 the magnetic flux was 273, a Index 11, K index 2 12/4 it was 271, 29 and 5. 13/4 257, 55 and 8. 14/4: 257, 105, 3 with JA and H44 being worked. 15/4: 258, 19, 1 with KG6JDX 5 x 6 on 52.017 at 2336Z incidentally, on 14/4 Bob VK5ZRO, having little else to do, worked more than 40 JAs. On 15/4 noted VK2ZAY 1044Z, JA 1128 to 1402Z up to S8. VK1 worked KG6JDX. KG6DX.

AFRICA WORKED FROM VKS

After all these years at last 6 metre signals have been coming out of South Africa and reaching Australia. On 18/4/81 at 0712Z Gerry VK5AGM on 28.885 worked Dave ZS6DN on 50.108. Gerry's report to Dave was S29, and about S5 on 28885 Distance 6188 miles. ZS6DN was using a yagi antenna, he tried a rhombic with signals S5! This contact was followed by one with Dick VK5ARZ with similar reports. These contacts, although crossband, are as far as is known the first VK to ZS6 contacts using 6 metres.

Since those first contacts there have been quite a number of contacts from VK5 to ZS6 crossband. So far signals have not been good enough for propagation to extend to 52 MHz (once again showing just what we are losing by not being able to work on 50 MHz). Jack ZS6LN has been involved in some of the contacts and also the ZS2E beacon has been copied from Prince Edward Island (south-east of South Africa) on at least two occasions on 50.047. The ZS6 stations have been copied at the VK5LP QTH on four occasions (on tape for proof!). Apparently the path is not a good one to the west, or actually 225°, as the signals from South Africa have never ever been really strong — maybe the time of the year is not quite right, perhaps September/October may be better than July. Time can only prove if this is so.

BACK TO SIX METRES

After the South African episode and our congratulations to Gerry for being the first to make it, it seemed 28885 got very cluttered — there seemed to be signals from everywhere! Also on 18/4 noted VK2 were working into W during our morning hours. WA8KLH/KH6 on 50.1 was 5 x 9. He tried 52.005 but not a sign of signal. VK2 and VK4 working KH3 Johnson Island.

Talking to Ross VK4RO on 19/4 he mentioned he had two contacts on 11/4 to KH3AB on Johnson Island, at /752 and /822Z, also to WH3ABB same island and same rig! VK4AFC and VK4RR in Cairns believed also worked them. Tom WK7KA a regular worker into New Zealand around 2100Z.

Ross VK4RO further reported ZS2SS had been heard in Townsville during the week. The KH6 beacon is not always operating when contacts are made with Hawaii, possibly due to looking for Africa. ZLs

have been working to USA almost daily throughout April.

On 18/4 flux 227, A 13, K5 Jack ZS6LN S19 at 0702Z 50.108 VK5RO worked crossband to ZS6LN at 0710Z VK9NS and VK9NL heard weakly on backscatter at 2240Z At 2300Z H44HIR beacon S9 H44RW on 50.108 S9+ at 2310Z KG6DX working VK7 W6SMS Zip heard on 52.005 at 2330Z S6 by VK5ZPW working VK4PU and VK4ZNC VK3AMQ 2349Z S2 on backscatter. Also VK1ZBJ and VK3AQR VK3AQR worked A8BA on American Samoa at 2242Z 5 x 4, four other VK3s and VK2 also. WSUW5 5 x 9 to VK3AQR (but no sign on 52 MHz)! Looks like something is brewing!

EASTER BRINGS A REWARD

Next morning it's up bright and early even if Easter Monday. It's still 19/4 by the Z day, but 20/4 loca time At 2236Z VK1FT and VK1VP noted working AHBA on 52.029 5 x 9. VK1FT reported OA4AWD was running a beacon on 50.005 and was looking for it. Runs 15 watts to a 6 element beam. At last VK6 can have a share VK6KZ and VK6WD and many others work YJ8PD at 2354Z and H44PT at 2342Z Signals from ZL1 and ZL2 reasonable a copy in VK5 at 2300Z

From that period onwards it was really on for VK5, the "Cinderella" State when it comes to exotic contacts. My own (VK5LP) log book takes up the story, but it was being repeated in various shacksheds throughout the VK5 area. At 2305Z KG6DX on 52.018 5 x 9 both ways. 2321Z H44PT 52.038 5 x 9 2341Z VK3OT 5 x 9 backscatter. 2354Z VK1ZBJ and VK3AMQ 5 x 6 backscatter 0044Z VK6KZ b/s 5 x 3. 0107Z split frequency contact with Lyall VS6BE Hong Kong 50.110 to 52.050 — what a split! Just as well I could use another receiver and separate 6 metre antennal 0421Z JH8HWL 5 x 9, plus others. 0750Z KH6IA 5 x 9 on 52.050D. From 0752Z a string of VK4s, VK2DXU (formerly VK6OX), and a good contact with VK4KZ/M, who was mobile at Surfers Paradise and using his handbag. 0710Z tried with ZS6LN but no contact. That's the log book, but it's only part of the story.

The notebook now takes up the narrative. For the first time ever heard an FM station on 49.995 at S9 + 30 dB at 0658Z, playing music and talking in foreign language, apparently from Singapore area. At 0107Z VS6SF who also worked VK3OT at least VK5ZPS VK5RO and VK5AGM VS6BE beacon heard by VK3AWY and VK6WD, and this still going strong at 0207Z It disappeared for 7 minutes a minute later, then came back at 0215Z at S2 and was soon S9 again 0358Z many JA areas at S9. At 0420Z Garry VK5ZK worked VS6DX in Brunei crossband 28 to 50 MHz, signals not strong. At 0650Z KH6EQI S3 and VK2DXU and VK4PU observed working WH6HTH/KH6 and others ZS6DN made an appearance on 50.105 at 0650Z At 0740Z KH6IA again 5 x 9 P29SIX beacon S3 same time

I could keep going on like that. But to summarize, VK5 stations worked at some time, sometimes more than once, the following: KG6, H44, VS6, JA, VSS, KH6, VK, ZL and heard on 50 MHz FO8DR, AH8A, VK9NL, VK9NS, ZS6LN, P25IX, AH5 and KH3. Other VK States were working or heard additionally N6CT, YJ8PD, and many contacts to W6 area. So on a count up it appears VK5 worked 8 countries, 7 of which were outside Australia, and heard another 7 at least on 50 MHz. The total count of countries into Australia for the Easter Monday seems to be at least 17, which would be rather outstanding by the standards of the Northern Hemisphere, let alone one Australia. As far as can be gathered most if not all the 50 MHz hearings can be authenticated as several operators have reported in with their tales, and times and call signs have been verified. So it was a really great day for Australia, again spoilt because so many promising signals were only heard on 50 MHz.

QUEENSLAND

John VK4ZJB called in to say that on 20/4 he and several other VK stations, including VK4PU, VK4ZMI, VK4WQ, etc., had done well by working to USA, e.g. 0829Z AH8A Samoa, 0845Z WA6DYA, 0920Z W8SMS 5 x 9 (also to VK2DUX) 0940Z KH6KUQ 5 x 9 0943Z W6A, 5 x 6, 0948Z AA6S 5 x 7, and at 0330Z VK5WQ worked VSSDX 5 x 9. The previous day John had worked W6XJ and WA6KLH, and just for good measure on 18/4 contented himself working 35 JAs.

THE NEXT DAY

Of course the band still had some sting in it on the Tuesday after Easter Monday. At 2253Z KG6DX was 5 x 7 on 52.025, KG6JDX 5 x 6 on 52.065, the latter having been observed at S9+ on CW on 50.110 at 2218Z. At 2302Z H44HIR S9, from 2300Z onwards past 0000Z AH8A beacon was S9 on 50.104 and was worked by VK5ZB and others at S8 and better — I couldn't hear them here that's how selective things get at times! At 2336Z FO8DR beacon S1 on 50.096 At 2342Z JH60FX beacon or keyer S3 to S5 on 50.109. At 0730Z ZS6 again

22/4 ZS6 observed working to KH6 during afternoon VS6BE weak to somewhere during the morning. The sting has gone

out of the band. On 23/4 Jim VK9NS Norfolk Island worked at 2330Z. At 2340Z FO8DR and W7KMA both observed on 52.010 for 5 minutes and rather weak; Dick VK5ARZ tried to work them. At 0014Z KG6DX keyer good. VS6BE keyer good signals between 0030 and 0145Z. On 24/4 around 0000Z VSS5LH crossband 50 to 28 MHz, then at 0029Z peaking S9 on 50.020. Les runs 25 watts to a 6 element beam, and advises they have been granted a special dispensation to work on 6 metres until July. Half their luck! H44HIR and KG6DX beacons available from time to time Tom noted working XE1GE.

25/4 0050Z KG6DX keyer S2 on 50.100. At 0112Z VSS5DX S2 on 52.006 at 5 LP but very strong in Adelaide. At 0120Z VSS5DX S8 on 50.100. 25/4. 2325Z H44PT observed working stations on 50.108 at 5 x 9, with H44HIR beacon S5 at same time. At 2330Z Peter moved up to 52.010 and worked several VK3s, including VK3AKK and VK3NM, plus VK5ZK, VKLP, etc. At 0120Z VSS5DX heard 5 x 7 on 28885, but nothing heard at all on 50.105 and 52.020 At 2245Z W6XJ heard for a short burst on 50.100, a bit weak but workable if on 52. P29ZF5 observed working a number of stations across the top end during the morning. To finish off the otherwise quiet day around 0715Z ZS6LN was worked crossband 50 to 28 by VK5ZK, VK5AGM and VK5RQ, but again too weak here, thanks to that hill!

HEARD WHILE ON THE BAND

When conditions are so good one tends to spend a lot of time in front of the receiver and always being on the lookout for news. Here are a few bits which may interest you

Firstly, congratulations to Steve VK3OT, who appears to have set a new Australian distance record for six metres with a contact to VP2VGR in the British Virgin Islands on 17/3/81, a distance of 16,620 km or 10,327 miles, using CW on 50.005 MHz At 2310Z Tim VP2VGR used an Icom 551D to a 5 element beam and Steve 8 elements also to a 551D.

The Queensland record also tumbled when Phil VK4AYX worked DL3ZM/YV5 on 19/3/81 at 2220Z on CW and SSB, with reports up to S7. The great circle distance appears to be about 15,500 km or 9,600 miles. Good work Phil

Tom VK2DDG at Byron Bay reported he too worked DL3ZM/YV5 in Caracas, Venezuela, on 18/3/81 for a possible NSW 8 metre record, distance being calculated to 15,223 km Time 2218Z, first two-way on CW then same on SSB. That's a good effort, Tom, and congratulations On 17/3 Tom reported working KG6JDX, then he heard the EL2FY beacon at 2340Z weakly, but able to identify KH6 was also available at the time. During March signals had been heard from the Caribbean area. Byron Bay is about as far east as you can go in Australia so Tom has a good take-off and not much in the way looking out over the water.

On 18/3 Tom also worked JA, W6TYX at 2130Z, W6BYA, a WA7, then at 2148Z WA6BYA 5 x 3 first SS contact 52.002. Heard XE1GE, SYRC beacon. On 21/3 heard TI2NA beacon 2355Z. On 10/4 copied ZS3SS whilst he was working KH6IAA. See what you can do with a good location!

Also heard on the air of possible beacons for Bundaberg on 52, 144 and 432 MHz. Noted also that Rohit VL2YK now has a TS600 and is likely to operate on 50.100. Has already heard VK8VF. Possibility of activity from BG7 from 25/4 to 2/5

During the extensive Easter Monday openings, a look across the band from 38 to 50 MHz produced a mass of unusual signals, FM stations of all kinds, including military stations, paging systems, taxi services, TV services, music of various types, and this would change from hour to hour as conditions swung around to produce signals from another area. Quite fascinating

SIX METRES IN NETHERLANDS

Peter VK5PS has written advising of a QSO with Charles PA0BDC in West Haarlem, Netherlands, recently. Charles is a keen VHF/UHF operator and asked that the following information be passed along to 6 metre operators here

The authorities have approved 3 spot (crystal controlled) frequencies on 53.875 53.925 and 53.975. The 53.875 spot is a beacon frequency for PA0DRYS which operates with an ERP of 25 watts. The other two frequencies are for calling/working on CW and FM only. The approval is for an initial one year period, to 14th February, 1982



I guess that's a start, and certainly better than nothing. Its main drawback is that the frequencies are almost a further 2 MHz higher than our 52 MHz band, and we have enough trouble now with a 2 MHz split from the 50 MHz end, let alone a 4 MHz split; I would think a USA antenna cut for 50 MHz would be a rather inefficient device if trying to operate 4 MHz higher. Thanks for writing Peter

NEWS FROM KYOGLE

One of my most constant correspondents used to be Andy VK6OX from Carnarvon, and we all know how much he got out of six metres from there. All things seem to come to an end, now I don't get any news from Carnarvon, but the news has started to come in from Kyogle, nearly 2,000 miles further east and from the same correspondent Andy, this time sporting the call sign VK2DUX! He hasn't been there long, but six metres has been treating him rather well than you!

Andy reports quite a number of eastern coast stations have been enjoying contacts to the Caribbean, Central and North America. These include David VK2BA, Bob VK2ASZ, VK3AQR, VK3OT, VK4RO, VK4PU, VK4AYX, plus others.

Stations worked so far by Andy include W6XJL, KH6IAA, W6HTH/KH6, YJ8PD, KG6JDY and many JAs. Stations heard include ZF2DN, Cayman Is., KP4AAN, K6FV, N8CT and numerous backscatter signals from VK2, 3 and 4 plus ZL.

MICROWAVES

From "Break-In" March 1981 To stimulate more activity on the 10 and 24 GHz band, the RSGB has been sponsored by Microwave Associates Ltd. to introduce two new microwave awards. These are open to amateurs world-wide and are to be given to those achieving the first ever contacts exceeding 1000 km on 10 GHz and 250 km on 24 GHz. The only rules are that the participants must operate within the terms of their licence. Claims should be submitted to RSGB headquarters together with a written statement from a senior member of the participant's national society, confirming the contact has taken place. To put these awards into perspective, contacts approaching these distances have already been made, so they are certainly not far out of reach.

On 10 GHz the most likely mode of propagation to yield success is super-refraction, as used for the current world record contact. It can be shown that the path loss on 10 GHz in a perfect super-refraction duct is 143 dB. A near minimum size of equipment to cope with this path loss would typically be a 5 mW transmitter, wideband FM in 250 kHz bandwidth, a 15 dB noise figure receiver and 0.3m dishes. UK experience suggests that ducts are usually less than perfect so something in larger equipment would normally be necessary.

Of the non-enhanced conditions necessary to cover this distance on 10 GHz, moonbounce offers a better chance than troposcatter. Even so, calculations show

that narrow band techniques, transmitters with several tens of watts output, GaAs FETs, pre-amplifiers and dishes at least 3m in diameter would be needed — perhaps out of the question for our style of amateur budget.

Since reporting last month on the Italian 10 GHz distance record, some further information has come to hand. The 757 km record was established on 12/7/80 between IGSNY/J in Brindisi, Southern Italy, and IW3EHO/3 and IGSOV/3 at Col Visent in the Italian Alps. Reports indicate that the QSOs were made just after sunset (1921 and 1927 GMT), after the operators had waited the entire day. The enhanced propagation (over-water ducting) coincided with a deep fade in their 2 metre liaison channel and lasted for about 10 minutes. The path chosen was interesting in that one end was high altitude (1650m) and inland, but had a line-of-sight path at grazing incidence, to the sea. This presumably allowed the 10 GHz signal to fire into the northern end of the duct at sea level. The other end of the path was right at sea level, on the coast. The equipment used was not particularly exotic. Wideband FM Gunnplexers with output of 10 mW to 1m dishes were used at both ends. Signals were Q5 and S5-S8.

It is a little surprising to find that most overseas practice still uses wideband techniques. Wideband refers to the IF bandwidth of the receiver, typically 200 kHz. While this used to be common with (and still is) klystron transmitters, the trend in this country (NZ) has been to use 30 MHz IFs with 50 kHz or narrower bandwidths for use with gunn devices.

NEW ZEALAND REPEATERS

Interesting to note that at last the New Zealand repeaters on 2 metres are to have a 600 kHz split in line with the Australian arrangement, and all must be changed to the new frequency and split by 28/2/1982 or go off the air! This arrangement will certainly assist contacts across the Tasman when conditions permit. I can still remember the problems in VK2 when the first large opening occurred into New Zealand and means had to be found to achieve a 700 kHz split!

TWO METRES

The poor old 2 metre band has certainly been neglected this month. I wonder what we missed there whilst everyone was congregated on six metres? I did notice, however, that on 9/4 a reasonable set of conditions prevailed across the Great Australian Bight to produce signals between Adelaide and Albany. VK6XY, VK6ZSP and VK6GWG were all on 144.1 with signals to S8+, but VKSRO was not really content with this, he wanted to try 6 metres, and found he could work Aub VK6XY on 52 050 at the late hour of 1500Z! What an hour for Es to be around!

The only other startling event that I can recall was to hear my friend of many years standing, Al VK5EK who runs a bank at Willunga, operating on Channel 51 FM loud enough for me to hear him.

THE MELBOURNE SCENE

With all the activity around Australia which one hears about by various means, either on six metres, ten metres or the grape vine, it's nice to receive an informative letter detailing what has been happening elsewhere. Such a letter comes from Gil VK3AUI and I find it interesting to compare what has been worked from Melbourne with other places. Gil writes

66163: JA1, 2, 3, 4 and 8 from 0852 to 0910Z when on 0937Z KH6 AA and at 1015Z WGHHTHSKHB. Then more JAs, finishing around 1310Z. 17/3 Good opening to JA, all districts except JA8 from early afternoon until 1423Z. At one stage JAs could be heard dog piling on YB1CS on 52 058 but we could not hear the YB. The JAs stood by whilst YB1CS tried for VKs, which says something for their operating manners! Not a peep, but many thanks to JA3EGE who contacted YB1CS and asked him to look and got the JA dog-pile to keep silent during the trial. This was around 1250-1300Z. VK3AZY worked a KG6 also.

20/3 WA4TNV/KL around 0300Z to VK3AUI, VK3NM, VK3AMK, VK3AQK, VK3AKK as far as is known. Frequency used 52-010. Some split frequency 52/50 as tried around 0100Z when Clay's keyer was strong on 50.110. Quiet until 28/3, when things started to hum to the Pacific and Caribbean FO8DR and XE1GE both heard on 50 MHz around 2000Z, also an appet of VP2VGR. Then VP1A on 50.097 and ZF2DH on 50.110. Both were 599 and in for half an hour or more before 0000Z to 0030Z. Everyone trying to get them on the air to work them, but they weren't on 28865 and no SID numbers available. FO8DR was alerted but by the time he got on 52 MHz it was too late (That 2 MHz difference once again — SLP). An 8P6 came up on 52 MHz but no luck. The signs from the Caribbean were so strong that when I first heard ZF2DH I thought a local had got the MHz switch in the wrong position!

Nothing until 6/4 when KG6DX was on at 0010Z. Some daytime openings between 29/3 and 8/4, but one has to work some of the time. Heard on 10 metres of one JA who worked over 150 Ws during one opening in November. 14/4 worked VK4ZJB and VK4KJL around 1047Z JA in from 1130 to 1200Z, worked JA2, 4 and 9. 15/4 More JAs around 1050Z. On 16/4 at 2100Z to 2200Z heard H44PT working Zs on 50.105, also snatches of YJ8PD. H44PT tried 52 MHz but signals not getting that high. At 2321Z on 50.109 whilst beamng NE heard a very brief burst of signal which sounded like the Woodpecker. Very watery with that fluttery modulated noise quality but it sounded like the Woodpecker. Maybe a harmonic and maybe by a very indirect path. Didn't stay long enough to be taped.

On 19/4 weak signals from W6XJ around 0200Z when VK4 working W6. At 2241Z worked AH8A and heard H44PT. At 0036Z (20/4 2Z) worked KG6DX, heard VS6BE but no contact. VK4 later, then JA. VK3 stations to work AH8A were VK3BOB, VK3BQS, VK3AQR and VK3ALI. VS6BE



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worked by VK3AMQ, VK3NM, VK3AQH and possibly others. JA1, 2, 7 and 8 during evening Qu's a day. 21/4: 2250 to 2310Z (20/4) AHBA worked by many with signals to 5 x 9 on 52.011 with the P29SIX beacon in at the same time and on top of the other one. At 2220Z KG6JDX 559 on 50.111. H44HIR 559 from 2238 to 2315Z right on top of AHBA contacts but luckily about 70° off in beam head ng.

The level of spurious signals from CRUDO (Channel 0) varies from tolerable to terrible but never gets down to the level the old ATVO did. It is always worse. An intermittent arc on the station from switch on for several hours can be seen on picture and heard on 10, 8 and 2 metres, which is bad. Doubtful if it would have been possible to work the ZS6 even if available in Melbourne due to the residual SS noise created by CRUDO! Such is life **99**.

Thanks for writing Gil, at least for April it looks like VK5 might have had the cream of contacts for once!

GARC VHF FIELD WEEKEND

Results have come to hand for the 1980 National VHF Field Weekend held last December, and are as follows—

Victoria. 1st VK3ATI, 5844 points; 2nd VK3ASQ, 5364; 3rd VK3BH, 4024 points.

South Australia. 1st VK5LP, 1245 points. Tasmania. 1st VK7JG, 514 points.

Check log: VK3YRP

A very nice letter accompanied the results table thanking me for my participation and prior publicity, sent by Mike VK3ASQ. Also advise that the Field Weekend will be conducted again this year, probably about the same time. Details later

SIX METRE DX STANDINGS

Bill Tynan W3XO is seeking lists from VK stations on countries worked for inclusion in his QST 6 Metres Standings Box, and has sent me a prepared form for reporting. Copies of this can be obtained from me by sending a SASE or you may complete the information in tabulated form using the following headings: Your call sign, date of application, country, station worked, 8 metre 2-way/crossband 6:10, date worked, QSL received yes/no, propagation mode, e.g. F1, Es, tropo, EME, MS, aurora, etc., transmission mode, e.g. SSB, CW, AM, FM, any remarks, your latitude and longitude, and address.

Please mail this information to Bill Tynan W3XO, PO Box 117, Burtonsville, Maryland, 20730, USA, to reach him by 1st September, 1981. Alternatively, if you wish to save on cost of air mail to the US, send your list to me before 20th August, 1981, and I will send it across with one of my frequent communications I have with Bill. Whatever way you do, take up the challenge and at least let the rest of the world know what countries have been worked from Australia with the handicap of only 52 to 54 MHz and geographically so isolated. The next move is yours.

70 CM TO NEW ZEALAND

Further to the information in the April issue re the 70 cm opening to New Zealand on 26/1 and 27/1, it seems the contact between John ZL1BVA at Mt. Maunganui and Barry VK2AHE at Newcastle over a distance of 2268.5 km would represent an increase in the previous record held by ZL1TAB and VK2BQJ by 110.6 km. The distance is subject to confirmation. Frequency was 432.190 MHz and signals were very weak, around 1233Z on 26/1/81. This was made possible due to an inversion layer developing at 700m on 0000Z and four hours later at 0400Z the inversion was evident at longitude 160° East at a height of 800m with a gradient of between 3 and 5 degrees. Temperature and pressure were reported as stable.

BRAZIL REPORT

From "Break-In" comes news that LABRE, the IARU society in Brazil, has announced a new 6 metre beacon for propagation research purposes. Call sign PY2AA, output of 25 watts to a ground plane on 50.055 MHz. Reception reports to PY2AA Beacon Project, PO Box 22, Sao Paulo, Brazil

ENDING

It's been a good month enough DX to satisfy most. This month's thought is 'The rising cost of car insurance is only by accident.'

73. The Voice in the Hills. ■

SPOTLIGHT ON SWING

Robin Harwood VK7RH
5 Helen St Launceston, Tasmania 7250



There has been quite a lot of discussion lately about "Woodpeckers" following the efforts of some individuals in Australia, supported by a magazine in Melbourne, that is putting pressure on Members of Parliament Cabinet Ministers and the Embassy of one particular nation, for its curtailment. While I do not sanction the publication of confidential telephone numbers of certain diplomatic personnel, I do feel strongly that action needs to be taken to reduce or modify these world-wide backscatter pulse transmissions.

In my opinion, the correct way of bringing attention to the effects of these pulse signals that cover a wide spectrum of high frequency bands with severe disruption to broadcasting and telecommunication services, is through the WIA Intruder Watch. The intruder Watch does pass its observations to the DOC as well as haise with other IW organizations overseas. They have been successful in removing and reporting several interlopers in exclusive amateur allocations, and are in the best position to document the disruption and effects of these backscatter pulse experiments.

However these "Woodpeckers" are not confined to the Eastern Bloc nations, as I believe that some beam headings of these pulses are coming from North American locations, and possibly Western Europe. Australia has also been experimenting with backscatter or over the horizon radar over the past couple of years but I don't know if the Jindalee Project, as it is known, is contributing to the proliferation of these annoying pulses.

Yet another theory behind these transmissions has been advanced. My attention was recently drawn to an article on the changing climatic conditions during 1980 with regard to drought, famines or floods increasing in many areas of the world. While the writer was concentrating on the religious significance to him of these events, he does infer that one Super Power has been experimenting with low frequency very high power transmitters to alter the earth's natural magnetic field, with the object of altering prevailing weather patterns.

If such experimentation has been, or is still being carried out, there could be manipulation of, and alteration to, prevailing weather patterns. This could give a strategic advantage to a potential aggressor; the alteration of meteorological patterns to cause natural calamities could then disrupt the communications of an adversary, or cause social and economic chaos.

These experiments are said to be based on the work of Nicola Tesla, a Yugoslavian physicist who emigrated to the USA. He certainly did investigate the effects of electromagnetic energy on physical matter.

Whether or not these "Woodpecker" pulses are really experiments in the above, or just backscatter radar pulses, the effects of these emissions will have to be minimised in order that HF users can utilize their frequencies without disruption.

Have you also noticed that solar flares and auroral disturbances cause weather patterns to change? In late April we experienced several solar flares and auroral flutter on HF signals. It caused some disruption and dropouts on communication circuits. At the same time Britain experienced unseasonal weather, with heavy snowfalls and blizzards, something which has not occurred since meteorological records have been kept since the 17th century.

Here in the southern states, our autumn was delayed up to mid-April. When the solar activity commenced, the pattern altered from being mild and pleasant to cold with very strong gale force winds. So it does appear to correlate. Keeping a record of your local weather conditions, together with your on-air observations, could be an interesting exercise. One DXer I know of maintains that the 28 day Lunar cycle can also affect propagation.

I have received a letter from Mr Llew Riley, of Chadstone (Vic). He queried if there are stations operational between 24.89 to 24.99 MHz. Well, from my observations, I have heard only a few FSK or multi-channel signals within this proposed new exclusive WARC allocation to the Amateur Service.

Llew also forwarded details of the Yaesu FRG 7700 S/W. I was unaware that there was another version of the Yaesu answer to the Kenwood R1000. This FRG 7700 S/W covers from 2 to 30 MHz, compared to 200 kHz to 30 MHz on the standard model. The price quoted was about \$100 below that of the standard FRG 7700. In all other respects, the Yaesu FRG 7700 S/W seems to be identical with the standard model.

Recently I was fortunate in being able to test the Sony ICF 2001 Microprocessor controlled receiver. This push button model operates from 150 through to 29,999 kHz, and from 76 to 108 MHz on FM. I do not intend to go to any depth reviewing this handy little receiver, as several reviews have been published recently.

Basically, if you want to listen on a certain frequency, all you have to do is to punch in the required channel, much like

a computer signal. For example, if I want to hear a station on 17795 kHz, all I need do is punch up 1-7-7-9-5 together with the red execute button and presto, there is the station on that channel! It couldn't be more simple, with no bands to change, no pre-selector to be peaked, or knobs to twiddle. It is only under 4 pounds in weight, and is 12½ x 2½ x 6½ inches in size (Portable enough to slip into a suitcase).

It requires 4.5 volts DC and utilizes three "D" size batteries in the radio section, and the processor section requires 3 volts DC from two "AA" size batteries. However, there is an optional AC adaptor that is almost mandatory, for the radio draws a current consumption of 700 mA. The adaptor does not power the processor which will last about a year with the two "AA" cells.

This model is ideal for the handicapped who have limited limb mobility or are visually impaired. There are no protruding knobs, and it certainly does not take up any room. Its sensitivity is good even with its own telescopic whip. Its selectivity is not as good as the more conventional receivers, such as the FRG-7 or the R1000, but its portability and cost compensate for this, making an ideal second receiver.

In next month's column we will be looking at the Vortex stations, together with their frequencies and times. Until then, the best of DXing and 73s!

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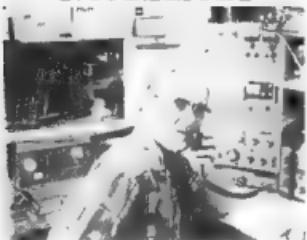
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AMATEUR SATELLITES



R C Arnold VK3ZBB

It was a pleasant surprise when Les VK3BKF brought Graham ZL3AAD and Peter ZE5JJ to see me recently. The three friends are EME fanatics and it was most interesting to hear accounts of the problems of working the "big satellite" without a transponder. Graham comes down to earth from time to time to work the OSCAR satellites and he is one of the very few overseas operators with whom I have had a contact via the Russian satellite RS1.

Amsat OSCAR 7 will be on its 30,000th orbit on June 8th and will be roughly overhead Melbourne at 10.11Z. At that time AO7 will have travelled some 1,477,500 kilometres since its launch, a quite outstanding performance and a great credit to all those dedicated amateurs involved in its construction and control.

Orbit predictions for June 1981

JUNE 1981

OSCAR 7				OSCAR 8			
Date	Orb.	Eqs	Eqs	Orb.	Eqs	N	Z
1	28933	0007	80	15659	0066	75	
6	28996	0048	81	15579	0120	81	
15	30109	0107	65	15704	0019	66	
22	30187	0152	107	15802	0062	74	
29	30284	0031	87	15800	0125	83	

Congratulations to Rod VK4ZRQ, who is now member No 167 of the Mode J Club.

OSCAR 8 has settled down and its temperature is now normal. However, operating is not straightforward and I have received several reports of its complete disappearance from time to time. This is possibly due to the attitude of the satellite as it passes northwards. Despite these reports I have not yet failed to locate the beacon on passes within sight of and to the south of Melbourne.

The photograph on this page is of a QSL card issued by ARRL to commemorate three years of operation of Amsat OSCAR 8. The card was received following submission of details of contacts through OSCAR 8 made during the week of this anniversary. The card is printed in red and it will be noticed that a USSR spacecraft stamp has been attached. The spacecraft are the Russian amateur satellites RS 1 and RS 2 launched in October 1978.



PHASE II B NEWS

- Still scheduled for launch on 24th February 1981 on L07
- Construction on schedule despite problems of parts procurement
- No further news on input and output frequencies
- Students of the University of Berlin are working on the antennas under the supervision of DJ4JC.

As the launch of UOSAT, scheduled for 15th September 1981, is rapidly approaching, the following article, reprinted from "Radio Communication" by courtesy of RSGB, will bring you up to date

UOSAT — THE AMSAT SCIENTIFIC AND EDUCATIONAL AMATEUR SPACECRAFT

By M. Sweeting, B.Sc., Ph.D., F.B.I.S.

G3YJO

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INTRODUCTION

The amateur satellite programme, born in 1961, has witnessed a total of 10 amateur spacecraft launched into earth orbit — of which five may be considered experimental (Phase 1) and five developmental (Phase 2). The first amateur spacecraft to be considered fully operational emerged from the AMSAT Phase 3 programme early last year, however, a failure of the European Ariane launch vehicle has delayed the realization of this operational stage until, probably, mid-1982.

Although the amateur satellite programme has reflected a substantial educational flavour, the emphasis during Phases 2 and 3 has been on producing amateur communications satellites primarily intended for increasing VHF and UHF communication range between amateur radio operators. Amateur radio is very much a self-learning and training activity even in its simplest manifestation and, as with other amateur offshoots of professional activities (such as amateur astronomy), has its peculiar resources contributed much to the overall understanding of its field. In recent years amateur radio has perhaps developed stronger communication skills at the expense of experimental skills, largely due to the impact of relatively cheap, mass-produced, high-technology equipment, and has in turn limited its appeal away from the broader audience of amateur scientists, technicians and dabblers who could so enrich the fraternity.

In an attempt to redress this imbalance, AMSAT-UK is constructing an amateur scientific and educational spacecraft (UOSAT) specifically aimed at generating interest among a wide range of imaginative

individuals in an important but now largely neglected aspect of amateur radio.

UOSAT is being constructed at the University of Surrey (UK) and is supported by AMSAT, RSGB, British industry and research organizations.

MISSION OBJECTIVES

The mission objectives may be summarized as follows:

- 1 To provide radio amateurs with a readily available tool for the study of the propagating medium through which they communicate from HF to microwave frequencies.
- 2 To stimulate a greater degree of interest in space sciences among schools, colleges and universities by active participation.
- 3 To broaden the scope of the amateur satellite programme and to encourage the interests of amateur scientists.
- 4 To establish an active body in the UK with the necessary resources to contribute flight hardware to the amateur satellite programme.
- 5 To study and evaluate the suitability of novel methods and new frequencies for use in subsequent amateur spacecraft.

SPACECRAFT SYSTEMS

The spacecraft systems may be considered as three components — service modules, experiment modules and the mechanical structure.

The service modules comprise all the functions fundamental to the basic operation of the spacecraft, such as the power sources, power conditioning, telemetry system, telecommand system, the general data beacon and the engineering data beacon.

POWER SOURCE

Four body-mounted solar array panels will each provide 27 WDC when fully illuminated. The average power available from the arrays per orbit will be approximately 17W DC, allowing for sun angle and eclipse.

BATTERY CHARGE REGULATOR AND POWER CONDITIONING MODULE

The BCR regulates the solar array power supplied to the 6Ah 14V DC nickel battery pack with an efficiency around 90 per cent. The PCM delivers regulated power supplies at +10V, -10V and +5V for the spacecraft's electronics systems with an overall efficiency of around 87 per cent.

The average power available to the spacecraft electronic systems per orbit is around 11.5W DC.

GENERAL DATA BEACON

A 450 mW beacon operating on 145.825 MHz will provide the prime interface from the spacecraft to the outside world. This beacon has been specifically designed to provide a healthy satellite-to-ground transmission link, enabling reliable reception by the simplest of amateur ground stations. The modulation form will be NBFM and in order to minimize doppler tracking, data will be transmitted by AFSK. The trans-

miss.ons will be compatible with standard, unmodified, amateur NBFM receivers, and only a small, fixed, cross-dipole antenna should suffice for all but the lowest elevation orbits. A low-cost audio data demodulator will be required to interface with the printer/display, details of which will be published. The beacon will also be modulated by speech from the synthesized speech telemetry experiment and data from the earth-pointing camera.

The data sources available to his beacon are 1,200 baud ASCII telemetry, 300 baud ASCII telemetry, 110 baud ASCII telemetry, 45.5 baud RTTY telemetry, 12/20 w.p.m. Morse code telemetry, synthesized speech telemetry, spacecraft computer asynchronous interface, and earth imaging system data.

ENGINEERING DATA BEACON

A 400 mW beacon operating on 435.025 MHz is the primary spacecraft engineering data and high speed experimental data channel intended for advanced amateur ground stations, advanced scientific experimenters and the ground command station network. The modulation form will be bi-phase PSK with the following data sources available: 1,200 baud ASCII telemetry, 300 baud ASCII telemetry, 110 baud ASCII telemetry, 45.5 baud ASCII telemetry; spacecraft computer synchronous interface; spacecraft computer asynchronous interface; spacecraft computer output port, earth imaging system data, direct magnetometer data and direct radiation counter data.

TELECOMMAND SYSTEM

Direct and positive control over the spacecraft's on-board systems is essential for efficient mission management and to minimize potential interference both within the spacecraft and to external services. The complexity of the space craft and its operating modes are such that manual real-time control alone would present an irksome chore for telecommand station operators and necessitate a comprehensive network of stations for maintaining day-to-day schedules. Two modes of control over the spacecraft are therefore available —

1. Direct, real-time control by the ground station network for unscheduled command status changes, command status initiation, coding initial and modified software into the on-board microcomputer positive control of the spacecraft when in a partial failure mode, and simple command changes.
2. Indirect, stored-programme control of the spacecraft executed by an on-board microcomputer upon predetermined schedules or telemetry performance analysis for day-to-day scheduled operation, spacecraft mode changes out of range of ground telecommand stations and surveillance of on-board telemetry and executive control in event of spacecraft emergency.

Positive control over the spacecraft is assured by a lowing over-riding precedence to control data emanating from direct

ground telecommand. This includes total shutdown of the on-board microcomputer.

The spacecraft computer will employ the same command decoding and distribution system as the direct command mechanism and will behave as a local "ghost" telecommand station feeding scheduled commands into the command decoder according to a programmed "diary".

TELEMETRY SYSTEM

Knowledge of the status and performance of the spacecraft systems is similarly essential for efficient mission management and to ensure longevity of the spacecraft's operation. Sensors located around the spacecraft will monitor parameters such as temperature, voltage and current, which are then encoded and made available, in addition to various other processed data, to a downlink beacon via a telemetry module. The basic philosophy of the telemetry system is to provide both a comprehensive surveillance of the on-board systems for engineering purposes and a wide selection of data formats to cater for differing ground station facilities.

Telemetry will be available at the following data rates

1,200 baud ASCII, 600 baud ASCII, 300 baud ASCII, 110 baud ASCII (asynchronous, seven-bit code); 45.5 baud RTTY (asynchronous, five-bit code); 12/20 w.p.m. CW (morse); synthesized voice.

Any combination pair may be transmitted by the two data beacons upon command.

The telemetry frame comprises 60 uniquely addressed analogue channels with 40 status flags and an identifier. The analogue channels have a range from 000 to 999 thus giving a maximum data resolution of 0.1 per cent. At the highest data rate (1,200 baud) each telemetry frame takes some 8s to be transmitted, which is somewhat less than the experimental instrument sample rate, thus instrument data is time-averaged and presented within the telemetry frame. High time-resolution experimental data is available via the spacecraft computer for more detailed analysis.)

In line with the mission objectives, UOSAT will have the following experiment complement:

PAGINATION STUDIES EXPERIMENTS

1. Phase referenced HF beacons on 7.001, 14.001, 21.001 and 28.001 MHz, enabling simple AOS observation to indicate ionospheric paths or more complex calculations yielding ionospheric electron densities.

2. A three-axis, wide range, flux-gate magnetometer for the examination of the fine structure of the earth's magnetic field and any disturbances to it and their relationship to radio wave propagation. This data will be available on the general data beacon (145.9 MHz) and with higher resolution on the engineering data beacon (435 MHz).

3. Two particle radiation detectors and counters (detecting particles with energies >20 keV and >60 keV) providing real-time information on solar activity and auroral events. This data will be available on the general data beacon (145.9 MHz) and with higher resolution on the engineering data beacon (435 MHz).

4. To microwave beacons on 2.4 and 10.47 GHz to study SHF propagation and the problems associated with inexpensive microwave satellite ground equipment.

EDUCATION EXPERIMENTS

1. An earth-pointing, solid-state, charge-coupled-device (CCD) camera will provide land and sea image data for transmission to simple and inexpensive ground stations via the general data beacon (145.9 MHz) using FM synchronous AFSK at 1,200 BPS — line synchronous. The image format will be presented as a 256 by 256 pixel digital array with each pixel having 16 possible digital grey levels. The entire image will be transmitted to the ground in around 3.5 min., stored in a solid-state memory and displayed on a domestic television. The ground image area will be approximately 500 by 500 km, providing a resolution of some 2 km on the earth's surface. The cost of the data demodulator, image memory and display electronics is around £100 and it is anticipated that modules and kits will be made commercially available.

It may be possible to use this visual display experiment to present processed telemetry and experimental data in a graphical format.

2. Telemetered data from the spacecraft and its experiments will be available at a variety of speeds and formats to cater for a wide range of ground-station complexity.

3. A limited repertoire of telemetry will also be available in synthesized speech for transmission on the general data beacon (145.9 MHz FM) intended for direct reception by the simplest standard NBFM equipment employing no more than a crossed dipole antenna.

The telemetry frame format will be as follows:

AMSAT	00000	00000	00000	00000	00000	00000	00000	00000	00000
AMSAT	00000	00000	00000	00000	00000	00000	00000	00000	00000
00000	01000	02000	03000	04000	05000	06000	07000	08000	09000
10000	11000	12000	13000	14000	15000	16000	17000	18000	19000
20000	21000	22000	23000	24000	25000	26000	27000	28000	29000
30000	31000	32000	33000	34000	35000	36000	37000	38000	39000
40000	41000	42000	43000	44000	45000	46000	47000	48000	49000
50000	51000	52000	53000	54000	55000	56000	57000	58000	59000

FUTURE SYSTEMS EXPERIMENTS

1. A combination of active and passive attitude control mechanisms based on gravity gradient stabilization and two-axis electromagnetic (magnetorquer) attitude adjustment will be evaluated. The spacecraft is designed to "fly" with the -Z facet (bottom) always pointing towards the geocentre. This facet will support the camera and the CHF, UHF and microwave antennas.

2. The 2.4 and 10.47 GHz beacons will be used to evaluate the usefulness of these frequencies for future amateur spacecraft in conjunction with relatively simple and inexpensive ground stations.

3. A powerful on-board CMOS microcomputer will have access to the S/C experiments, telemetry and command systems enabling: telemetry surveillance, command and status management, experimental data store and processing (e.g. image processing, data reduction), orbit data, operational schedules and general news dissemination, and attitude control.

The spacecraft computer is based around the RCA CMOS CDP 1802 microprocessor and has direct data links with the magnetometer and radiation detectors' experiments. This enables fast sampling of experimental data yielding fine time-resolution structure of these fields. The S/C computer also interfaces directly with the speech synthesizer experiment which can be fed with processed telemetry, experiment data or plain text. Analysis of navigation informa-

tion from the magnetometer (using it as a coarse sensor) and correlating with an existing model of the earth's magnetic field will allow closed-loop attitude control employing the two-axis magnetorquers.

The spacecraft computer will have access to the telecommand decoder input in parallel with, but on a secondary basis to, the direct ground command receiver. Control data emanating from ground command stations will have priority over locally generated control data at all times, and the S/C computer will have positive shut-down upon ground command in the event of computer malfunction. The S/C computer will be capable of generating the appropriate command repertoire locally as directed by software resident in its memory. This software is loaded from the ground by command stations using the telecommand uplink channel. The entire software library resident in the spacecraft computer can be modified or replaced during flight by ground telecommand stations, in order to accommodate changes in the mission profile and to allow for the rectification of possible software or hardware failures.

ORBIT

UOSAT is currently scheduled for launch by NASA into a sun-synchronous, polar, earth orbit in September 1981 as a secondary payload upon a Delta 2310 launch vehicle accompanying the Solar Mesosphere Explorer spacecraft. The programmed orbital elements are as follows:—

Altitude, 530 km, Period, 95 min., Inclination, 97.5° sun-synchronous, 3 p.m. descending node.

The expected orbital life-time of the spacecraft at this altitude is around 4-5 years before re-entry. ■

QSP

SYDNEY RIO YACHT RACE 1982

New entries have been received that the Hornby and District ARC and the Manly Warringah RC have undertaken to arrange for the radio amateur involvement concerning this yacht race in 1982 in connection with the event Barry White VK2AAB writing.

"We wish to recruit two amateurs to take part in the race aboard two of the larger yachts in the fleet. The operators selected would need to be available from Mid-January to about the end of March."

Operators will need to hold an ACOP and be able to copy at least ten w.p.m. without error. As a member of the crew they will be expected to contribute to the crew expenses for food etc., of about \$10 per day. They should be in good health and hold a valid passport.

The race will take about forty days for the slowest yachts and on arrival in Rio the operators will be able to live on board until their return. It is anticipated that two air tickets will be available for return to Sydney.

Ocean racing or cruising experience would be an advantage but is not necessary. Operators interested in taking part should contact in the first instance to Hornby and District Amateur Radio Club Box 302, PO "Horres" NSW 2007."

All previous responses received by the Executive office have been forwarded to VK2AAB.

NEW PREPARES

The call sign series JBA-JBZ has been allocated by the ITU to Saint Vincent and the Grenadines according to the April 1981 issue of Radio Communication. ■

BRIGHT STAR CRYSTALS PTY. LTD.

35 EILEEN ROAD, CLAYTON, VICTORIA, 3169, AUSTRALIA

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TELEPHONE: (03) 546 5076

ELECTRONIC OVEN OSCILLATOR UNIT

FREQUENCY RANGE: 1 MHz to 100 MHz to order.

STANDARD VOLTAGES: 8-12V DC Other Voltages to order.

SUPPLY REQUIREMENTS: Start up 450 mA.

Running at 25°C Amb. 150 mA.

CONTROLLED TEMPERATURE:

Standard 65°C ± 0.1°C adjusted to crystal turnover point.

Other temperatures available to special order.

OSCILLATOR: OUTPUT 100 mV P.P. FINE TRIMMING 50 P.P.M.

STABILITY AFTER SWITCH-ON:

1×10^6 in 1 hour, 5×10^7 in 4 hours, 1×10^8 in 1 week.

OPERATING TEMPERATURE RANGE: Ambient 0 to +40°C.

AGEING RATE: Better than 1×10^{-6} /day after 100 days.

DIMENSIONS: 38 mm Wide, 25.4 mm Thick; 90 mm High.

R.W. ELECTRONICS
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SYDNEY — TEL. 666 8144

WEST TEST ELECTRONICS
PERTH — TEL. 337 6393

FRED HOE & SONS P/L
BRISBANE — TEL. 277 4311



DILMOND INSTRUMENTS
HOBART — TEL. 47 9077

AWARDS COLUMN

Bill Verrall VK5WV

IYPP NATURAL HISTORY AWARD

This prestigious innovative Natural History Award is sponsored by the Radio Amateurs Group of the Victorian Disabled Citizens Association The Jaycees of Victoria. It promotes "Amateur Radio for the Disabled Person, 1981" and features fauna and flora in full colour prints. The six colour prints measure 7 cm x 5.5 cm and are mounted on each award with a place for endorsement seals. Green, 70 points; blue, 70 points; red 75 points; silver 90 points; gold, 110 points. **Total 500 points.**

The award will be issued to all applicants including SWLs attaining the first plateau of 70 points. There is no time limit. Basic award donation \$44.00. Application for the additional points endorsement seals will be issued at no cost to the applicants. Self addressed envelope, size 14.5 cm x 9 cm is required for endorsement seals. Each award will be individually numbered and signed by the award custodian and president of VDCA.

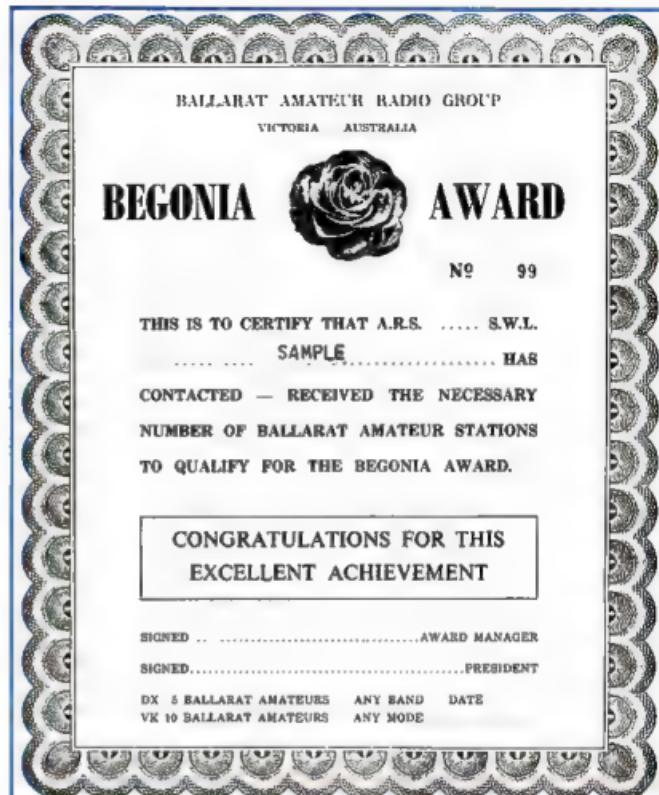
RULES

Verification/log entries must be clearly legible on a check eg, counter signed by two licensed amateurs known to the applicant. QSL cards should not be sent to the awards custodian. Any egal type of emission may be used providing communication is established on or after January 1st, 1981. All bands from 160 to 144 MHz can be used Cross band and the VK3APU Monday/Thursday night 3575 MHz net contracts will not be allowed.

Logs must include the following details: applicant's name and address, call sign, SWL's registration number if applicable, date, time GMT, type of emission, frequency, signal report, band(s) for which application is made and whether endorsement seals are involved. Applicant's location at the time of each contact if portable/mobile operation is involved. Log entries should indicate whether you are a physically disabled amateur, SWL, or a ve/unter/supporter amateur (blind/bodied). SWL applications will be accepted and the YDP Natural History Award issued with appropriate endorsement seals as applicable, when all conditions listed are complied with. SWLs, whether registered or not must include both call signs and names of licensed amateurs in submission of log extract to claim this award.

ALL FUNDS generated by this innovative award will be used to assist the visually disabled and the wheel chair mobile amateur and SWL.

Address all correspondence to the
Awards Custodian, 1 Balfour Street, Don-
caster, 3108, Victoria, Australia.



Victorian Disabled Citizens Association



NATURAL HISTORY AWARD

This is to certify that the VDCA
Natural History Award has been awarded by

to the amateur in accordance
with the conditions and rules

Yours Kindly Date

Chairman

President

1981

for working amateur stations located in
Ballarat

VKs must work 10 Ballarat amateurs
DX stations must work 5 Ballarat amateu-

rs. Any band, any mode, will qualify

The cost of this award is \$2.00 Aust
or equivalent and log details only are re-
quired.

The award is printed on white matt
card in three colours, the flower is in red,
all printing in dark blue and surround
in tan; measures 250 x 300 mm

DX WIDOWS AWARD

This is a rather novel and innovative
certificate which may also be obtained
from the Ballarat Amateur Radio Group.
You do not require any QSOs for this
award, just your XYL's name and your
call sign! The cost of this certificate is
\$2.00 Aust. or equivalent

I must admit that my XYL, Joan, has
cheerfully suffered the traumas of being a
DX widow at various times and she whole-
heartedly agrees with the captions in-
cluded on this certificate, although cans of
beer in this ham shack (and in VK5!) are
somewhat of a luxury! I am sure your
XYL would appreciate the thoughts con-
tained in this certificate and I commend it
as an extra when applying for your Be-
gona Award

However, with the enormous increase
in the numbers of licensed lady operators
over the past two or three years, I often
wonder how many DX widows there are
out there? (Sorry, ladies, I could not resist
it)

This award measures 295 x 225 mm,
printed in red and black on yellow card
You may not be able to read the printing
on the accompanying photo reduction. If
not, I suggest you send \$2.00 to Maureen
Batt for a copy

Both Ballarat awards may be obtained
from Maureen Batt, RSD Rokewood Junc-
tion, Vic. 3351 or BARG, PO Box 216E,
Ballarat East, Vic. 3350, Australia.

Good Hunting

CONTESTS

Val J. Watkins VK2DEW
Box 1065, Orange 2800



JUNIOR
19/21 SMIRK QSO Party CQ 6/81
20/21 All Asian Phone Contest
FCM & CQ 6/81

JULY

1 Canada Contest CQ 6/81
4/5 Venezuelan SSB Contest CQ 6/81
11/12 IARU Radiosport Contest
17/23 SWOT QSO Party
18/19 Colombian Contest
18/19 SEANET Contest CW
25/26 Venezuelan CW Contest
25/27 County Hunters CW Contest

AUGUST

15/16 SEANET Phone Contest
15/16 Remembrance Day Contest

Exchanges: All Asian — OM, RS(T) plus
YL, RS(T) plus OO. SMIRK — Call,
State, province or country and SMIRK
number

The "Oops I Really Goofed It" department

The goblins got in again in the results
of the Australian Novice Contest. The winner
was in fact Steve Bazley VK2NMB. My
apologies

Results of the 1980 National VHF Field
Weekend conducted by the Geeong
Amateur Radio Club during the first week-
end of the last Ross Huli Contest —

Victoria. 1st VK3ATI, 5844 points, 2nd
VK3ASQ, 5364 points; 3rd VK3BH, 4024
points

South Australia 1st VK6LP, 1245 points.
Tasmania 1st VK7JG, 514 points
Check Log VK3YRP

QSP

QSP NEWS

ARRL President is setting up an ad-hoc committee
of amateurs knowledgeable in the 900 MHz region
of the spectrum to develop a detailed proposal and
supporting rationale for the allocation of a new
USA amateur band at 902-929 MHz — March 1981
QST

MORSE

The editorial in Ham Radio, Feb. '81 foreshadowed
Ham Radio's interest in arranging a contest in
the USA for the world high-speed CW champion-
ship. The current record is Ted McElroy, ex W1JYV,
who copied Morse code at a speed of 75.2 words
per minute on 2nd July 1980

YOU and DX

G [Nick] Nichols VK6KX
6 Diner Place, Ferndale, WA 6155.

VKland, Australia, a place regarded by many amateurs world-wide as the ultimate Utopia, a place they turn their beams toward. A chance for a bit of peace and quiet away from the kilowatts and bad-mannered dog piles, a guarantee of a good QSO, a friendly chat, a smile, a bit of warmth.

Really does sound idyllic doesn't it? Such a pity that of recent times it's just not true. What has come over this amateur community of ours? Have we lost all sense of good manners? Quite simply it is my belief the answer is YES.

My congratulations to the operator of a recent DXpedition for tearing strips off a VK6 using tail-ending tactics that really had to be heard to be believed! I sincerely hope that what he may have worked you he may have been absent-minded enough to omit you from the log, and whilst I may clearly have pointed the finger, many others were just as bad throughout VK. Certainly many are deaf or can't count. There may be a few K.W.s in this country but our prefix is VK not ZL, we aren't in the USA either, but to the VKs who got on a list by absent-mindedly omitting the first letter of the 'r' call (how don't tell me you all had slow VOX relays that day), I am tempted to say you won the raspberry of the year award—but even that would be too good for you.

No I haven't finished yet—in fact I'm only just getting started. For the novices in particular (but by no means limited to them), when a DX operator comes back with—your call! 59 QSL he is instantly dictating to you the way he expects you to reply, he certainly doesn't care a hoot if your name is Steven (spelt with a ph), that you live in Widgee-moo-lah some 897 kilometres (that's 557 miles), seven yards and 81 mil metres from Toonwatsitsname, are running 27.75 watts PEP from a super-duper block box into three element tri-band lumps of soggy spaghetti at 70 feet (that's 21 782 metres) above the ground! HAVE I MADE MY POINT? I SERIOUSLY DOUBT IT. Dozens upon dozens of times the DX stations were asked to repeat their calls—what are you doing in a pile up in the first place, if you're oblivious of whom you're calling? Don't bother to answer that, you're obviously on some sort of ego trip.

And what about the FHB on 10 metres? Having apparently completed some work on his antenna installation he went and pointed it at VK, looking for some companion reports. He got them all right. A screaming hoard of VKs all yelling 59 QSL. Would you blame him if he didn't point this way again?

Even nets run by VKs are much the same. Just how many net co-ordinators do we need on any one net? Certainly not 6 or 7 all doubling, waiting, repeating and generally messing it up. Oh, and while on the subject, if playing guessing games with your report from the DX station via a co-ordinator who carefully ensures that, after three or four tries (with a generous amount of prompting) you get it correct is "DXing" then I for one intend taking up a new hobby! If you can't get your report on the first or second attempt (allowing for deliberate QRM) without ANYONE'S help have the intestinal fortitude NOT to log the contact. You may not improve your country's count but at least what you have logged was not via the "quiz game method."

FACT AND FICTION

3 V activity has been rumoured for some months, a group of JA ops are said to be involved. Nothing heard on the bands yet so perhaps next month.

Kermadec—Dave K6LPL has shelved this one due to lack of finance.

KP4/D—many rumours on this one—some saying it will go off immediately as a helicopter is available, whilst others state no licence has been granted. We will just have to wait and see.

TY—Benin to receive plenty of attention during late May/June. In follow-up to the reactivation by TYA11 (funny call but it is legal).

SV7HL has been active but failure of a rotor control box has limited his beam headings severely; a replacement should have arrived by now which should save Reverend Ted the chore of ladder climbing. He's promised to look toward VK more often.

ON THE BANDS

10 metres

No doubt conditions will have severely deteriorated but for those of you who gave this one some attention over the last month the pickings to be had were exceptional. On Phone VP8QG, J73PP, CP6EL, ZP5RG, 8R1J, HR1MZM, CE6AE, FY7AQ, FP0FSZ, 8P6PF, HK0FBF, HT7JML, HR3JJR, WH3AAB, AD05/KHNSK, 9W8 WB, VS5DG, JD6JSI/6WB, CSADU/6WB, SV7HL, 3C1MMA, 9J280, AX9F, 7X2LS, 5XFSS??, FM80M, 5N9GM, T32AB (Line Island), 9X5PP, TL8CN, 8G1AA, 5H3AA, 722AP, C31UI, OY9R, plus many other rare and semi-rare countries far too numerous to list. On CW things were pretty bright also, CX4BA, FO8EW, T30AT, 4S7MX, VP8PK, JA8ACN/JD1 and elusive Zone 40 was represented by TF3JO.

15 Metres

The only time I got down this far was to drag things up to 10, however for the novice I understand on Phone A22AA, VK0AJ, ZK1CK, YS9VE, GD3LSF, 6W8AR, 7P8AC and 4N7NS were available, whilst on CW a whole mess of activity kept the brass pounders happy with EA6GG, E19Q, FG6FOO/FS, HI8JVF, T30AT, VP2EV, SH1CH and Nara 9M2LN were in demand.

20 Metres

A CW report only this month (never could see the point of battling the kilowatts when the higher bands are wide open)—CN8AT, CX6CW, FB8YH, FORGM, OD5XL, HZ1HZ, TF3NA, ZB2EO, FM0FOL and TL8RC were some of the more notable active stations.

40 Metres

On Phone if and when you could get through the northern QRM (not to mention the VKs rag-chewing in the prime DX window) GW3AX, FK8CR, A35JE, ZP5AL and HR1RMG were loud enough to hear through the "junk", whilst on CW KH3AB, OA8CP, XT2AW, VP8BK and VP2EV were much easier to hear but very much in demand.

80 Metres

On Phone, though openings were infrequent, OA4AWD, ZS6BN5 and JAs were heard but CW remained as dead as a post.

My sincere thanks for the sudden and quite unexpected upsurge in contributions which enabled me to comment on the bands between 25 MHz, SWLs Eric L3-0042, Maurie L3-13062 with written and on-air reports from VKs 8N1L, 2DPI, 3NSR, 3VYP, 3MXX, 3VHA, 3AWY, 2VAB and 3AKK.

QSL INFORMATION

CSADS — via DL1LD,
7PBAC — via PO Box 828 Masaror
OY9R — via K2IJL
4U1UN — via W2MZV,
9M8MH — via PO Box 678 Sabah
9J2BO — via W8ORD
HR1MZM — via PO Box 761 Tegucigalpa,
Honduras.
J5AG — via SM3CX5.
9G1AP — via 10LCJ.
3C1MM — via EA1QF
VK0AJ — via VK3AWY.
6W8AR — via DJ3AS.
8P6PF — via VE3IVE
8Q7BF — via JA1ETE
7Z2AP — via IBYCP,
WH3AAB — via Box 4 Johnston Island
APO, San Francisco 96305
9M5WB — via PO Box 70, Tawau Sabah
Malaysia.
HP1XOJ — via WB3KGY
KG4KK — via N6AWD
VP8PP — via PO Box 224, Stanely
VP8WA — via PO Box 38, Stanely
VP5TCI — via PO Box 78 Grand Turk
FP0FSZ — via VO1FB
9X5PP — via PO Box 863, Kigal
TU2IJ — via PO Box 520 Abidjan
VP2MGQ — via N4MDO
OH3XT/DH0 — via Home Call!
ZP5PT — via W3HNK
HC8Z — via W3HNK
J28CC — via F6FGN
T19FAG — via T12VVR
VP2MEA — via KP2A Home Call or
NE4R/KB4QD

DL2VK/ST3 — via DF9FPM
VP2VGR — via VE1ASJ
CE6AE — via WA3HUP
W4PRO/CED — via Home Call
EA6GJ — via Box 2, Esparas
FB8YH — via F3KH
KP4KK/DU2 — via WA3HUP

NOVICE NOTES



Edited by Ron Cook VK3AFW

PEAK ENVELOPE POWER — WHAT IS IT?

This article discusses that much misunderstood quantity Peak Envelope Power. Read this carefully and be one of the few to know what PEP means.

Peak Envelope Power (PEP) measurements are necessary for all amateurs as most transmitters are now limited by the Department of Communication's Regulations in terms of PEP output. Before we measure anything we ought to know clearly just what that thing is. Many among us, as the cartoon shows, do not understand PEP.



Good evening. Our new energy policy will include a Bill to change the charges for electricity tariffs onto a PEP basis, thus doubling the revenue now earned.

Consider a simple CW transmitter running say, 10 watts DC input to the final amplifier. Now assume that it is an efficient amplifier and produces 7 watts RMS when connected to a 50 ohm resistive load. The load will heat up and will get just as hot with the 7 watts of RF as with 7 watts of DC. This is of course to be expected as by definition 1 watt RMS of RF produces exactly as much heat as 1 watt of DC.

Any RF power meter calibrated for RMS can be used to measure the output power of our CW transmitter if the key can be held down long enough for a steady reading to be obtained. It should read 7 watts for our example.

An oscilloscope (CRO) connected across the load would show a picture similar to the signal depicted in Fig. 1. We could measure the peak voltage, V_p , from the CRO and would expect to read 26.46 volts. For a sine wave signal without distortion (no harmonics) the RMS voltage, V , could be calculated from the formulae $V = 0.7071 V_p$ and $V = 18.71$ volts. As power = V^2/R we would then find the power was 7 watts.

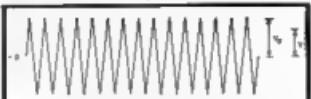


FIG. 1: Unmodulated CW carrier.
For 7 watts rms into 50.0 ohms, ($R = 50.0$)
peak voltage, V_p = 26.46 volts
rms voltage, V = 0.7071 V_p
= 18.71 volts
power = V^2/R

Fig. 2 shows the envelope or outline of the peaks of the RF signal for an unmodulated CW carrier. The carrier has a power of 7 watts and as it is always at the peak it is easy to see that the envelope represents a power of 7 watts. The PEP output is in fact 7 watts. The peak and average powers are equal. Note that power is defined as the rate at which energy (e.g. heat) is produced. We are therefore concerned with RMS quantities, not some airy-fairy thing invented by audio amplifier salesmen.



FIG. 2: Envelope of unmodulated CW carrier. The envelope is the outline joining the peaks of each RF cycle. If $V = 18.71$ volts, PEP = 7 watts.

Suppose we now key the transmitter and send a series of "As", with a space equal in duration to a dash as illustrated in Figs 3 and 4. If we assume that the transmitter and its power supply operate in the same manner when the key is down for a short time as when it is down for several seconds (see later), then the RMS power during dots and dashes is still 7 watts. In between it is 0. The power during the peak of the envelope is 7 watts PEP out as V_p is the same as before. But, because the key is closed for half the time, an ordinary power meter would read only half the previous value, namely 3.5 watts. We have now discovered that for keyed CW signals the average power = $PEP \times$ duty cycle factor. Using our oscilloscope we can measure V_p as before and calculate PEP as before.

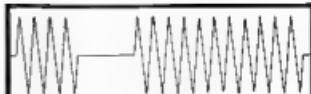


FIG. 3: Keyed CW carrier, morse letter 'A'.

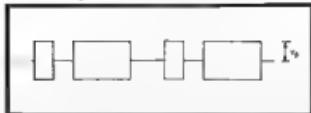


FIG. 4: Envelope of keyer CW carrier, part of morse sequence 'AAAA --- A'. Peak envelope power = 7 watts rms. Average rms power = 3.5 watts if there is a space equal to a dash between successive 'A's.

Now, if our amplifier is a linear amplifier class B operation perhaps, then we could apply an SSB signal. The envelope of a two-tone signal is shown in Fig. 5. The two tones may have any frequency provided they are not harmonically related (refer to the regulations). Suppose we increase the level of the two tones equally to the point just before clipping of the peaks of the envelope occurs. If our oscilloscope shows $V = 26.46$ volts we again have 7 watts PEP output. A true RMS wattmeter would show only 3.5 watts as once again the duty cycle factor is effectively 0.5.

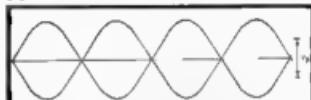


FIG. 5: Envelope of two-tone SSB signal.
PEP = $V_p^2/(2R) = V^2R = 2V^2R$
where $V = 0.7071 V_p$
and I = average rms current.

If we now switch to voice we may see an envelope similar to that in Fig. 6. If V_p is as before then the PEP output is still 7 watts although the duty cycle may be only 30 per cent.

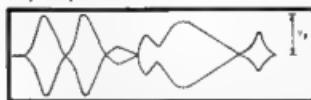


FIG. 6: Envelope of voice (SSB) signal.
PEP = $V_p^2/(2R) = V^2R$
where $V = 0.7071 V_p$.

SOURCES OF CONFUSION

There are many sources of confusion for example here are three:

With some power supplies the voltage may remain steady under voice conditions but sag under key-down conditions. This is because of poor power supply regulation caused sometimes by insufficient filter capacitance. Fig. 7 illustrates the effect on a CW signal. If the peak voltage sags by 20 per cent then the PEP output sags by

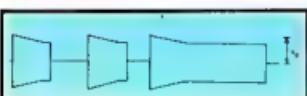


FIG. 7: Envelope sag caused by poor power supply regulation.

44 per cent. Some operators measure the CW output and multiply by a factor of $\sqrt{2}$ to 2 to estimate their PEP output. Modern equipment in good order is just not that bad.

Another source of confusion is the Regulations Handbook. It recommends the use of a two-tone signal adjusted for maximum undistorted RF output into a dummy load. The RF line current is then measured on an RF ammeter (just where oh where, can you buy an accurate RF ammeter with 1A FSD, good to 30 MHz, for the novice?). Because of the duty cycle the power computed from P_R is doubled to obtain PEP out. Some amateurs use the factor of two in conjunction with the DC input (measured while saying "ARRRRH!" loudly into the microphone) to obtain PEP. The DC power is either doubled (to boost the ego) or halved (to pretend that the output is less than 400 watts) and if the desired answers are not obtained a further factor of 0.7 may be applied (while muttering about efficiency and peak-to-RMS conversion) to get the desired numbers.

A third source of confusion derives from AM transmissions. As hardly anyone uses AM I will not discuss the matter in any detail except to say that it may provide unwarranted justification for applying a factor of 4 to get an acceptable answer from a disagreeable set of measurements.

MEASURING PEP

This is a topic deserving a full column in itself so I will save that for the future.

In brief however, I prefer the oscilloscope as a measuring and monitoring instrument. Unfortunately the price of an oscilloscope with frequency response flat to within 5 per cent to even 30 MHz makes it uneconomic. I do possess an RF ammeter with 3A FSD. I was obtained many years ago from a disposal store and I have calibrated it on DC.

Several of our advertisers offer commercial PEP meters of good quality at reasonable prices. I would be pleased to publish details of any simple, effective home-brew PEP meters developed by readers.

There is another economic and cunning alternative. Harold Hepburn VK3AFQ has designed a novel PEP meter using an LED display. It is available commercially for under \$50 (beave) and is advertised in this magazine. I have insufficient space this month to discuss its operation, but suffice to say that the DSC will accept the instrument as an alternative method of measuring PEP.

73 de VK3AFW

Conversion Details for some AWA Carphones

Ray VK2BVO in "Smoke Signals" Jan 1981, Central Coast ARC Newsletter

The conversion data presented here is to enable anyone with an AWA carphone to convert it from its commercial frequency range to the appropriate amateur band (6m or 2m). The crystal formula for 2m is $(IMHz - 2)/14$. At the time of writing, I couldn't locate the formula for 6m conversions. (Perhaps a reader could supply this information for subsequent publication —Ed.)

High Band MR10B to 146 MHz

Tx Increase C14 to 82 pF, C12 to 47 pF, C21 to 15 pF.
Add 4.7 pF across secondary of 1T2 (pins 2 and 3).
Add 22 pF across primary and secondary of 1T3.
Close up L4 and 1T6A as required.

Rx Increase C15 and C16 to 33 pF, C31 to 22 pF.
Rewind primary and secondary of T9 with 5 turns.

High Band MR10C and MR20A to 146 MHz

Tx T8 Increase C92 to 22 pF, C89 to 33 pF.
L9 add 2.2 pF across winding.
Close up L11, L12 and L16 as required.

Rx L1 L1 add 1.8 pF, L5 add 1.8 pF. Increase C54 to 15 pF, C6 and C7 to 39 pF, C58 to 22 pF.

High Band MR20B to 146 MHz

Tx Increase C117 to 39 pF, C118 to 22 pF
L9 add 2.2 pF. Close up L11.

Rx L1, L3 and L6 add 1.8 pF. Increase C66 to 47 pF.
Add 4.7 pF across primary TR2 and secondary TR1.

High Band MR3 to 146 MHz

See October 1965 of "Amateur Radio" page 2 and 14 (photocopies available from most Division libraries, also public libraries in capital cities —Ed).

High Band Cyclophone to 146 MHz

Tx TR8 add 6.8 pF across both windings
L9 add 1.8 pF, L11 rewind with 4 turns 16 SWG.
Remove C94, C115 and relay RL2

Rx L4 add 1.8 pF.

Low Band MR10B to 52 MHz

Tx 1T4 add 15 pF across both windings
L9 add 1.8 pF, L11 rewind with 8 turns 16 SWG, 1T6A, 1T6B with 5 turns 16 SWG.

Rx L1 rewind with 18 turns 24B&S tap 3 turns from cold end
T1 rewind with 18 turns 24B&S
T9 add 7 pF (resonate at 40 MHz)

Low Band MR10C and MR20A to 52 MHz

Tx T11 add 15 pF across both windings
Rewind L11 and L12 with 8 turns 16 SWG 5/16 dia. x 3/4 long.
Rewind L13 with 6 turns 16 SWG 9/16 dia. x 7/8 long
C125 increase to 100 pF

Rx L1 add 4.7 pF, L2 and L3 add 3.3 pF,
L4 and L5 add 10 pF

Low Band MR20B to 52 MHz

Tx L8 and L9 add 15 pF, L11 rewind 6 turns, L12 rewind 18 turns, L15 rewind 10 turns

Rx L1 and L2 add 4.7 pF, L3 add 3.3 pF,
L5 and L6 add 10 pF
C6 increase to 39 pF. N.B. This value is critical and may vary on some units to achieve neutralization.

NOTE: If narrow band filter type SQ57975 is being removed and replaced with wide band filter type 3Q57975 the 2.2 pF across the input and output of the filter should be removed.

All coils should be wound on the same diameter and spacing as originals unless otherwise specified.

WICEN

QUEENSLAND WICEN

Considerable organisation has taken place within the past 12 months to make Queensland WICEN into an efficient State-wide group.

The State has been divided into five regions each with a Regional Co-ordinator. Within each region are appointed WICEN officers and to date some 30 towns or cities have their own WICEN officer. These officers are charged with the responsibility of promoting an awareness of WICEN within their own club and area. They are also involved in forming local emergency nets and offering their services to the statutory authorities such as the State Emergency Service and Natural Disaster Organisation.

A weekly net of these WICEN officers and Co-ordinators is held to disseminate information and to answer queries.

The network operated successfully during the recent cyclone "CLIF", again during the Brighton storm rear Brisbane and numerous smaller search and rescue operations.

As an exercise, communications were provided as a safety measure with the Brisbane to Gladstone Yacht Race. A continuous link with the yacht "Rustad" on which our operator Frank VK4CFF was installed, was maintained throughout the race.

Forthcoming exercises are the Lutwyche Car Rally in the Nambour area and a combined SES exercise in the MacPherson Range involving a search and rescue operation.

Any Queensland operators requiring information on WICEN should contact the State WICEN Co-ordinator, Box 638, Brisbane, Queensland 4001.

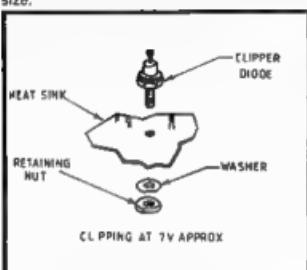
Ken Ayers VK4KD

Qld WICEN Co-ordinator

From Bob Tait VK3YSH we have four items.

1. ANTENNA HINT

Fig 1 shows the method I used to lock the adjustable section of my skeleton slot. The tubing was split in four places and then crushed to form a collet which locks on the rod with the aid of a nut of suitable size.



2. LOW-COST DIODES

The other items which I feel will be of interest to amateurs is the Lucas 4DS5 rectifier which is a 3 phase device with a static rating of about 20 with a PIV of 100 watts or more. These packs are thrown out by auto-electricians if a single diode fails, however they are quite good for any single phase power supply. See Fig. 2

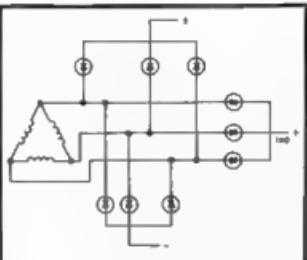
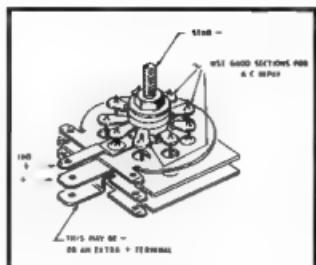
I have included drawings and circuits to indicate how these can be used. The part numbers of suitable packs are 83166, 83185, 83192, 83062 and 83285. The difference between assemblies is the termination only. So I suggest you get friendly with the local auto-electrician and raid his rubbish bin.

3. SUPER ZENER

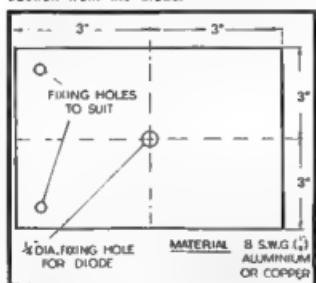
How about a 100W 14V zener, suitable for protection of that 6A power supply, details for Lucas part number 49345 as used to regulate motor cycle alternator output by loading at the battery is as follows:-

ZENER DIODE AND HEAT SINK

A stud-mounted Zener diode part number 49345, will be required. The diode must be mounted on a heat sink to prevent its working temperatures from rising above the designed operating range. The heat sink must be made of copper or aluminium sheet approximately 0.125 in. (3 mm) thick, have a minimum area of 36 square inches, and be as square as space limitations permit. In practice, it is found that an area of 6 in. (152 mm) x 6 in. (152 mm) (as shown in Fig. 4) can most readily be accommodated. The diode must be mounted as near to the centre of the heat sink as possible. Care must be taken to see that the metal of the heat sink is clean, free from enamel and flat around the diode



fixing hole to ensure maximum heat conduction from the diode.



4. SUPER CLIPPER CLIPPER DIODE

Here are details of a Clipper diode which may be of interest.

A common fault experienced with machines equipped with direct lighting is the blowing of bulbs. This may be due to faulty dipper switches, causing momentary voltage surges, bad connections or intermittent earths. Whichever is the cause, the Clipper diode effectively protects bulbs against excessive voltage, but of course will not prevent failure caused by vibra-

tion, filament fractures or faulty bulb manufacture. The Clipper diode is available under Part No. 83137.

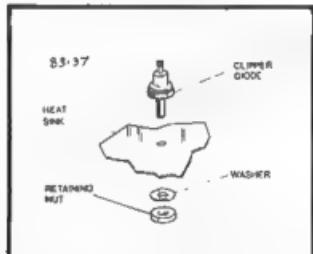
Installation

The diode is wired into the circuit so that when the lights are switched on, the generator also supplies the diode. This can be achieved by connecting either into the tail-lamp feed or the wire supplying the dipper switch. If no dipper switch is used the connection could be made directly to the headlamp bulb feed.

Either an aluminium or copper plate not less than 16 gauge in thickness and measuring 3 in. x 4 in. (76 x 102 mm) is required. Mount the diode on the plate by drilling a 0.1875 in. (4.77 mm) hole approximately in the centre of the plate, ensuring that all burrs are removed from round the edges of the hole so that the base of the diode bears flat on the plate.

Mount the plate on the machine in a convenient position so that air circulates around the diode and plate when the motor cycle is in motion. Do not position the unit too close to the ground or wheels since salt-contaminated mud and water may corrode the diode body. If the heat sink cannot be properly earthed, connect an earth lead between the heat sink and machine frame. The earth lead must not be soldered to the diode or connected between the diode base and heat sink.

Bob Tait VK3YSH



MOBILE TRANSMISSIONS

In Victoria Regulation 153(1) of the Motor Car Regulations 1966 (Statutory Rules No. 44/1966) states, inter alia, that the driver of a motor car shall not while the motor car is in motion, use any telephone, microphone or any other similar instrument or apparatus in such motor car. The only exemptions are drivers of motor one-tractors touring on charter in the metropolitan area who may use a fixed or throat microphone. "Motor car" includes almost everything, (including motor cycles) registered for use on the roads. "Microphone" obviously would include a boom mike on a single headset. So far as is known there is nothing to prevent a passenger (other than the driver) from transmitting/receiving whilst the car is in motion. It is permissible that similar regulations apply in other States.

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Antenna Tuner \$139, FC902 Antenna Tuner \$235, FC107 Antenna Tuner
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VK/ZL/Oceania DX Contest 1980 - Overseas Results

PHONE SECTION	JASAUJ	5746	VK PHONE								Total
OCEANIA	JASCPG	5394	Call	160	80	40	20	15	10	—	315780
W7LPF/DU2	JHSGDW	4950	VK1FT	—	—	440	7972	17236	106502	133251	1110
DUEPZ	281	JAE8IF	VK1LF	—	—	—	1110	—	—	—	1110
P29CH	12860	JASABG	VK2NBA	—	—	—	—	—	—	315780	315780
SW7BZ	18200	JACBNL	VK2APK	—	—	—	11105	83284	30378	225267	225267
YJ8SS	57447	JACCM	VK2VAB	—	550	—	—	29854	148268	173800	173800
N. AMERICA	JASBFT	1220	VK2BAN	—	—	—	89992	—	—	66992	66992
VE3EVK	705	JASPL	VK2BAM	—	800	—	4560	1082	20100	25472	25472
VE1AVX	210	JATYAA	VK2BQS	—	280	—	6120	4270	9486	20158	20158
VE7DXU	75	JAYVAL	VK2ABC	—	—	—	13741	—	—	13741	13741
VE7BS	16	JADOLE	VK2DEW	—	—	—	—	—	—	9108	9108
WA4QMC	3312	JAKTM	VK2WA	—	—	—	3408	6	168	3884	3884
NU4H	463	JATBAL	VK2VHP	—	1140	—	—	1380	1020	3540	3540
WS2DB	2440	JATGD	VK2VHP	—	—	—	—	—	—	—	—
N8A	8	JATFFY	VK3BQA	—	—	—	37696	61200	38640	137556	137556
K5M7/7	5594	JHTGG	VK3BQH	—	—	—	—	—	—	—	—
N7DF	2928	JHTHNF	VK3BHN	—	46	—	77598	36314	1827	116514	116514
A19JB	10808	JHTWKQ	VK3BVA	—	—	—	21730	31440	63170	63170	63170
K8MMW	30638	JHTYKQ	VK3BXB	—	—	—	—	—	—	7920	7920
A19J	10808	JHBYM	VK3DAK	—	—	—	—	—	—	5285	5285
WSRKP	check	JASBW	VK3DSM	—	—	—	5244	—	—	5244	5244
ACDN	2980	JASBY	VK3NIH	—	—	—	—	2522	240	2782	2782
WCDC	1020	JASD	VK3JMD	20	—	180	84	872	856	856	856
K0CB	check	JASMLE	VK3JUP	—	—	—	—	3	748	751	751
E. AMERICA	JASBKW	158	VK4BD	—	—	—	—	—	—	—	—
LUSCW	1119	JADCGI	VK4LT	—	—	—	11284	8212	482338	56612	56612
JADCF	3100	JADCOL	VK4NHL	—	60	—	—	60514	617275	677849	677849
ASIA	JADGHA	2076	VK4NLX	780	240	1080	18392	137818	121212	278420	278420
JAI1EY	30953	JADGD	VK4NLU	—	—	—	—	53972	163299	217269	217269
JAI1DY	15156	JADGB	VK4NFU	—	80	—	—	55600	56322	112202	112202
JAI1PL	13072	JADGQB	VK4NBU	—	—	—	—	—	43470	43470	43470
JF1JLW	6396	JADGZ	VK4NGL	16	—	—	—	—	19272	19272	19272
JE1CDD	4004	JADKG	VK4NGU	—	—	—	—	—	—	—	—
JR1JUR	3100	JADLG	VK4VBD	—	450	—	—	8078	8178	14704	14704
J1A1AO	3925	JADLG	VK4VHZ	—	—	—	—	10870	78	10745	10745
JAA1AAT	1892	JALSPG	VK4DX	—	—	—	—	—	—	740	740
JADDCO	1221	JASNYT	VK4PJ	260	—	—	169	2	48	419	419
JL1ONG	920	JASUJ	VK4SMB	—	—	—	—	—	—	—	—
JAI1GP	667	JADBG	VK5MS	—	—	—	472384	105840	87246	665470	665470
JAI1IT	810	JADLSV	VK5HVVW	—	—	—	—	33386	14552	47748	47748
JE1PUJ	468	DK1AF	VK5HBD	—	—	—	—	17864	7200	26084	26084
J1E1ZF	480	DL8XA	VK5SRK	—	—	—	—	—	5320	5320	5320
J1F1FO	342	DL8MB	VK5SRK	—	—	—	378	—	—	378	378
JAI1UN	342	EAOQW	VK5OU	—	—	—	25	342	—	267	267
J1A1GY	336	EASNA	VK5NSN	—	—	—	—	152	72	224	224
JM1CPA	232	EASIA	VK5NLU	—	—	—	—	—	—	—	—
J1A1EDO	152	EASCR	VK5NLU	—	—	—	—	—	—	—	—
J1A1RDP	84	EASJRK	VK5AJW	—	—	—	4848	15840	124425	144913	144913
JH1COV	36	EATATE	VK5ENH	—	—	—	—	—	107199	107188	107188
JAI1ZSK	8	FBWE	VK5EFS	—	450	—	78718	7482	13257	99914	99914
JM1LQL	4	FBDRP	VK5ENID	—	1230	—	—	478	55226	67092	67092
JAI2AYH	11872	G3RRS	VK5GNAT	—	—	—	—	45240	—	45240	45240
JR2QZU	5925	G3CZF	VK5GJS	—	—	—	1015	3554	16068	20834	20834
J1E1EQ	3145	G3VPW	VK5ZX*	—	—	—	3975	28080	30132	62167	62167
J1A1YEF	2832	G3UVZ	VK5ZX*	—	—	—	—	—	—	—	—
JH2RAV	2112	GSMY	VK6D	—	—	—	—	—	—	—	—
JH2JJC	1488	HA4XX	VK7MC	280	220	—	—	—	—	—	800
JAD2D	1417	HA4XH	VK7MC	3565	—	—	—	—	—	—	—
JAD2ZA	1384	HA5HX	VK8BE	361	—	—	587	9288	9288	18143	18143
JAD2ATE	1355	HA5HVD	VK8BE	40	—	—	—	—	—	—	—
JAD2CES	729	HA6IG	VK8INC	24	—	—	—	—	—	1580	1580
JAD2XLV	838	HA8HNA	VK8KXW	414	—	—	—	—	—	182228	182228
J1E1TV	344	HA9KZ	VK8KXW	552	—	—	—	—	—	—	—
JAI1TT	1032	HIBAAA	VK9NDK/LH Lord Howe Is.	9184	—	—	—	—	—	—	—
JF1SIR	3870	HIBIK	VK9NDK/LH Lord Howe Is.	2247	—	—	—	—	—	487088	487088
JAD2PRG	1099	HIBDX	VK9NDK/LH Lord Howe Is.	440	—	—	—	—	—	—	—
JG3CVJ	600	HNOA	VK9NDK/LH Lord Howe Is.	1080	—	—	—	—	—	—	—
JASJV	279	J4CSP	VK9NDK/LH Lord Howe Is.	994	Cell	160	80	40	20	15	Total
J3H9XKA	270	JQDQV	VK1FT	156	VK1FT	—	1685	5556	6000	5733	24255
J3E2GT	80	J5BQNG	VK1FT	54	VK1FT	—	—	—	—	—	—
J3RQZ	58	J8PT	VK1FT	510	VK1FT	—	—	—	—	—	—
J4YVPH	13688	LA4W	VK2APK	112	VK2APK	—	—	63854	112230	32091	208575
J4V4ZV	5635	LA5VY	VK2BQD	12	VK2BQD	—	12380	43216	70450	36168	162174
J4ADEI	3069	LA4HH	VK2AQF	check	VK2AQF	—	1540	4785	15874	21868	36288
J4KXWU	1535	LA4GM	VK2AQF	check	VK2AQF	—	—	—	169560	—	169560
J4AQR	580	LA5QK	VK2AQF	check	VK2AQF	—	—	—	—	—	—
J4SK	368	LA8CJ	VK2AQF	check	VK2AQF	—	400	3625	16224	47124	20727
J4XAE	224	L22RF	VK2AQF	2468	VK2AQF	—	26520	—	15892	—	42412
J4IDT	4	L22KQZ	VK2AQF	608	VK2AQF	—	80	1955	—	70	24000
J4SPU	9636	L22KTS	VK2AQF	1440	VK2AQF	—	—	—	—	—	25105
J4CAKX	7990	(Cont. next page)	VK2AQF	—	—	—	—	—	—	—	(Cont. next page)

VK CW (continued)

Call	160	80	40	20	16	10	Total
VK3XB	360	14280	—	—	3430	—	18170
VK3PL	2240	1200	—	7676	796	4524	16438
VK3AMD	—	—	—	8849	40	2775	12855
VK3J1	—	90	1350	1376	6528	756	10100
VK3SM	4400	—	—	—	—	—	4400
VK3KS	240	1430	—	—	—	—	1670
VK3VEU*	—	10	—	—	1288	27	1325
VK3SV	100	80	—	—	—	—	180
VK3BLD	—	—	—	—	72	—	72
VK4XA	400	2210	70875	44082	81640	140332	339569
VK4LX	1080	1260	26380	25773	125756	58289	233729
VK4UR	—	—	—	40659	—	—	40950
VK4SF*	—	—	—	1890	3186	7859	12745
VK5VO*	—	—	—	195	2950	5858	9001
VK5RX	—	—	—	—	—	1026	1026
VKEKL	880	—	—	—	—	—	880
VK6AJ	—	—	—	—	—	—	—
VK6PS	—	60	8415	12600	13144	36218	70480
VK6RZ	—	—	36500	—	—	—	36600
VK7MC	1680	17850	—	—	—	—	19040
VK7RY	480	—	—	9882	1802	—	11364
VK4ZZ	80	—	—	6715	1584	812	9981
VK8BE	—	—	—	36	220	714	970
VK9NC Norfolk Is.	—	—	—	—	—	—	780
VK2NDK/LH Lord Howe Is.	—	—	—	—	—	—	6272
* denotes QRP	—	—	—	—	—	—	—
SWL	—	—	—	—	—	—	13780
ZL0042	—	—	—	—	—	—	—

ZL PHONE

ZL1BQD	—	26860	23310	—	112144	435744	597688
ZL1AKY	—	—	—	—	77520	448323	528752
ZL1AXB	—	—	—	523151	—	—	523151
ZL1APK	—	—	—	—	—	238151	238151
ZL1ANH	—	—	24095	160312	49640	—	236047
ZL1MQ	1080	—	—	3008	12444	20782	37294
ZL1AFU	—	—	—	500	24472	3774	28746
ZL1AMM	—	—	—	—	—	22491	22491
ZL1NK	—	180	—	—	—	—	180
ZL2ACP	—	—	—	—	—	709886	709886
ZL2AH	—	—	—	18612	59857	139956	214245
ZL2BG	—	50800	—	—	—	—	50800
ZL2BH	8500	9400	—	—	—	—	14900
ZL2AKT	—	—	—	3	2	11703	11714
ZL2ADP	—	—	—	720	1248	336	2304
ZL2AQK	—	—	—	—	—	—	—
ZL3ABC	—	10	—	22261	—	27	22298
ZL4PX	1680	8260	—	—	—	—	9960
ZL4J	—	—	—	—	—	—	check

ZL1BQH	—	1440	—	—	85346	21594	108380
ZL1AFW	—	—	1020	12852	26128	39474	79474
ZL1AU	—	—	—	35000	—	—	35000
ZL1HV	—	—	—	6565	24112	3045	33722
ZL1MQ	20	—	—	14780	242	2629	17881
ZL1AMM	—	—	—	—	—	15576	15576
ZL1BGT	—	1800	1120	520	2604	1658	7700
ZL1BQD	20	1100	4750	—	—	—	5880
ZL1NK	—	280	—	—	—	—	280
ZL2VS	—	2850	61215	—	74236	41811	180112
ZL2OM	—	—	—	—	169454	—	149454
ZL2AOY	—	118260	—	—	—	—	118260
ZL2BKK	160	39840	—	—	—	—	40000
ZL2AKT	—	—	—	525	14180	—	14685
ZL3AGI	—	—	—	26814	—	—	26814

EUROPE PH. [cont.]	W1 EVT	3770
OE3NPW	5902	2553
OE5BB	1206	540
OE5XBB	5100	32
OH1KX	5100	784
OH3MH	752	K2BX
OH2BPE	480	WB4RAU
OH6HU	238	1187
OH3DX/2	96	KSMA
OH3AA	60	5793
OH2BZ	60	W5SOB
OH2BMP	56	K5MM/7
OH6DW	32	10690
OK1TA	5157	N7DF
OK4XG	678	400
OK32M	check	K7KWA
OZ4PM	2880	320
OZ8BZ	1908	WT7QK
OZ5EV	1116	8105
OK3CFA	5805	12110
OK1AZ	5157	KV6KVY
OK3V5Z	3854	8274
OK3ABU	1120	S. AMERICA
OK2BQL	650	PY1OPL
OK2DX	756	8094
OK1AGN	456	ASIA
OK1JST	108	JK1DPL
OK2BZJ	60	J1PCN
OK1NC	60	2392
OK2BZJ	60	JA1SJY
OK2PDL	34	2075
OK2BHM	16	J1AODE
OK1AZI	18	1740
OK2PDE	14	JH1MTR
OK2BNK	check	JH1BCY
OK1ASQ	check	JF1LKM
OK1AFO	2075	JL1QNG
PI1ADS	407	90
PA0COR	270	J1LJUY
PA0LVK	268	JAZ U
PA0CF	check	JAZ2EF
SM4QAU	8534	4484
SM4DXC	2766	J2B1EQ
SM4CVT	4988	4228
SM5MPB	1508	J3KPV
SM6LGW	780	175
SM4BDY	check	JR8HTT
SM5ARL	check	JR8WXA
SP5BT	741	8474
SR7AWA	122	JM1SLP
SP5ENK	87	JM2AIIU
SP5CMA	8	JM2PHR
SP8AXA	8	JM2JYV
SR8PDF	1470	JH9UYB
Y37XJ	2475	968
Y57ZJ	1801	J4RCG
Y53YF	1140	552
Y43ZI	884	JAF4MBS
Y44QR	10	3304
Y49UH	620	JASALC
Y48UK	check	JH9EJ
Y48UJ	check	JASBW
Y34R1	check	JAC9CWJ
P442K	check	JABERG
Y39TA	check	JH8DCJ
Y31PA	check	JH8DBA
Y250A	check	JADGBA
Y28D0	110	1304
Y41ZH	94	JH7WIKQ
Y39ZQ	70	JAT7DXE
Y42ZQ	70	JAT7PMZ
Y49UH	check	JH9EJ
Y48UJ	check	JASBW
Y34R1	check	JAC9CWJ
P442K	check	JABERG
Y39TA	check	JH8DCJ
Y31PA	check	JH8DBA
Y250A	check	JADGBA
Y030K	162	8140
Y030K	158	JADGB
Y030K	18	JAGZG
YU7ECQ	4129	IM2KG
YU3UJK	1254	EUROPE
YU1NUF	996	D4SO
YU1OBA	866	DK1PF
YU7N2R	546	E42IA
YU7AJD	132	E47ALG
No logs received from USSR		
E42CR	88	
E43QS	84	
E44BV	40	
G3MY	720	
G3KSH	545	
G3VW	360	
G4QZ	8	

CW SECTION

(Cont. next page)

EUROPE CW (cont.)

HAIKZZ	816	Y36ZB	2
HASKHG	328	Y23UF	check
ISYDI	385	Y22CM	check
LA2KD	48	Y31SB	check
LA1VL	32	Y31XF/P	check
A7XB	check	Y33VA	check
A4DM	check	Y38OA	check
LA4XK	check	Y38ZG	check
LZ1XL	234	Y39ZL	check
LZ2DR	24	Y47XN	check
LZ2KZ	15	Y48ZF	check
LZ1KSN	2040	YD3KSG	2
OE3NPW	298	YU7NGO	840
DH2CZ	1302	YU1AST	210
OH7JK	653	YU2P/J	36
CH2BPE	410	YU7SF	10
OH7PV	242	YU7ORQ	8
GH17W	128	ZB2EO	784
GH9TD	44		
O24PM			
O21LD	1037		
O28AE	384	SWL SECTION	JAI-18277
O22RH	146	JAI-4665/1	6833
C21EE	check	JAI-18132	3090
CK1PGN	1700	JAI-30223	2976
CK1AMI	860	JAI-19113	2070
CK2GX	872	JAI-22458	1880
CK2BHM	351	JAI-24842	415
CK3KVR	242	JAI-30124	11418
CK3BCI	234	JAI-33469	5403
CK3CAU	52	JAI-8330	12584
CK3FDN	36	JAT-8552	1378
CK2ABU	36	JAB-3769	4784
CK1CJU	21	BRS-34249	3125
CK1AZI	6	BRS-1068	1168
CK3KEU	3	DL-P10-1802002	140
CK1MAC	2	LZ1-O-64	1738
CK1MAC	2	DH1-145	2289
CK1AQ	check	OK1-21672	630
CK3DEG	100	OK3-2716	360
CK1CJU	40	OK3-26684	300
PACOF	check	OK1-11881	200
SM6CVT	1566	OK1-21610	124
SM5E2U	510	OK3-2094	120
CK2FZCZ		OKV-19973	50
SM5AYM	check	OE1-10479	264
SM5APS	check	SP-0048-K1	814
SM6KZW	check	SP-0023-SK	744
Y21D	3100	SP-3003-LK	560
Y23JA	516	Y2-517/G	8260
Y22LB	344	Y2-1026/E	5876
Y31PE	320	Y2-7316/I	3200
Y55PL	224	Y2-6405/N	1175
Y24EA	208	Y2-EA-7509/C1118	
Y21CF	120	Y2-5876/B	8
Y31XA	82	SP-0334-KA	366
Y48SA	14	Y2-8867/G	check
Y64YG	8	Y2-9540/A	check

This 1981 contest was organised by NZART in New Zealand.

The 1981 contest will be organised by WIA in Australia. The dates are—

Phone 3/4 October

CW 10/11 October

24 hours run 1000Z or each weekend.

Good DX and 73 from ZL . . . Jock ZL2GX, NZART Contest Manager

FROM THE CONTEST MANAGER:

The scoring system used was an extension of that introduced in 1978 and the revised points allocation for various bands seems to have met with acceptance and approval. With changing conditions in the future, some variations might be necessary—but for the present, current points allocation could remain stable.

Use of prefixes as multipliers for VKs and ZLs has also proved interesting and workable. Contrary to some previously expressed opinion, the need to look for new prefix multipliers IS an important factor.

NZART cannot agree with the proposal to accept contestants' scores in place of a log—but the need to rewrite a whole log is not accepted either. The use of carbon copies is quite acceptable and is suggested as a means of overcoming the log problem. There is no need for writer's cramp except during the contest.

While the suggestion of "contest lire" areas on each band might sound "good", its practical application is doubtful.

The QRP section should be deleted as the interest displayed is minimal. Scores made by Novice stations are so high (in some cases) that it is doubtful whether a separate section is necessary for this group of operators. The question of a restricted time section (6 hours or so) is open to debate. It was not many years ago that each section of this contest was spread over two WHOLE weekends . . . THAT sure WAS a marathon . . . my memories of the 1948 contest (and others) is still very fresh—ZL2GX.

VK AND ZL INDIVIDUAL BAND SCORES

Open — Phone	Open — CW
VK5MS	685470
VK4LT	556812
VK4HHL	577646
ZL2ACP	709686
ZL1BQD	597886
ZL1AKY	526752

160 m — Phone	160 m — CW
VK3XB	7820
VK4LX	725
VK7MC	260
ZL2BHZ	5600
ZL1BQD	180112
ZL1MC	1060

80 m — Phone	80 m — CW
VK6HID	1330
VK2VHP	1140
VK2BAM	660
ZL1ANH	24085
ZL1BQD	23310

40 m — Phone	40 m — CW
VK4LX	1080
VK6FB	450
VK1FT	440
ZL1ANH	21126
ZL1BQD	4780

20 m — Phone	20 m — CW
VK5MS	472884
VK2APK	111605
VK6FB	77815
ZL1XB	523161
ZL1AKY	449223
ZL1ANH	160312

10 m — Phone	10 m — CW
VK4LX	157816
VK5MS	105640
ZL1BQD	112144
ZL1AKL	77520
ZL2AH	56887

15 m — Phone	15 m — CW
VK4LX	157816
VK5MS	105640
ZL2ACP	70680
ZL1BQD	148454
ZL1AKL	85346

10 m — Phone	10 m — CW
VK4HHL	517275
VK4LT	482356
VK2HBA	315780
ZL2ACP	70680
ZL1BQD	148454
ZL1AKL	235161

QRP — Phone	QRP — CW
VK5ZK	68167

should be for a four hour consecutive period only . . . Have a portion of each band out-bounds for contest purposes . . . Sorry about the mess but hope you can read the logs OK (yes I do). Any log is better than no log, I suppose and the answer to that is YES! Beams came down and three family emergencies Propagation — what a shocker! . . . Had Jesus trouble with splinter from 10/20kc wide Russians.

FROM OVERSEAS LOGS

"I love VK/ZL contests" "What is Oceania?" "From Eu condx were terrible" "Disappointed so little Oceania DX" In answer to THAT comment, this is a sample of what was available—KH5, 3D2, SW1, VK2/LH, P2, VK9 Christmas, VK9 Norfolk, DK, YJ8, YC1 VCO, FOB KX8, VK1, VK7, VK8, 3M2 Not too bad sure y

(NOTE Overseas results will be in "Amateur Radio" and "Break-In" and will not be posted to VK and ZL contestants)

MAGAZINE REVIEW

Roy Harkop VK3AOH

Since this column is not merely a list of all the titles in every magazine listed, it may be helpful to occasionally give a short explanation as to how the titles mentioned are selected.

The first criterion is relevance to Australian interests and conditions. The second is originality; if for instance it is just another regulated power supply, it is not likely to rate a mention. Also articles with attractive titles and very little content are avoided. It is most disappointing to go to special trouble to get a magazine and then find the title is the best part of the article. Finally, some articles are missed simply because the magazine has not been available.

As usual, the articles are divided into one or more of the following categories: (C) Constructional; (G) General; (P) Practical without detailed constructions; Information; (T) Theoretical; (N) of particular interest to the Novice.

SHORT WAVE MAGAZINE Jan. 1981

Long Wire Antennas (G, N)

RADIO COMMUNICATIONS Feb. 1981

VFOs Investigated (G, N); Two Element Three Band Beam (C); LED Indicating Wavemeter (C).

CO-TV Nov. 1980

ATV Up-Converter (P); Video Switch (P).

73 MAGAZINE Jan. 1981

Logic Probe—Unfortunately the use of "True" and "False" in the description of how the logic probe works makes the explanation unreadable even to the extent of confusing the writer himself. Carefully substitute H (high) and L (low) and the sequence will become clearer. The confusion is compounded by using "1" and "0" in the timing diagram—(P), Heat Sink (T).

Feb. 1981

Caution: Solid State Finals (T)

GST Feb. 1981

Vertical Antenna Directivity (T).

HAM RADIO Feb. 1981

1296 Solid State Transmitter (C); Moonbounce (G), 80 Metre Receiver (N)

ALARA

AUSTRALIAN LADIES' AMATEUR RADIO
ASSOCIATION

The next meeting of ALARA is to be held at Mavis's VK3KS, when a farewell is to be tendered to Daurel VK3ANL, the Secretary of ALARA now for two years. Our thanks go to Daurel for her work and also best wishes as she and OM Art return to USA. Jessie VK3VAN has agreed to take on the secretarial matters for this year. Mavis VK3BIR is Treasurer, so please send subscriptions and badge orders direct to Mavis. Newsletter Editor is Geraldine VK2NQI.

ALARA Awards Manager Mavis VK3KS has distributed 24 ALARA awards to date. Please send your applications direct to Mavis, QTHR, for quicker return.

ALARA membership is now 125 (VK) and 35 (DX).

ALARA NET

Mondays at 1030 GMT on or about 3.570 MHz. A roster is now operating.

OPEN HOUSE NET

Tuesday and Thursdays, 1000-1200 GMT on 14.322 MHz, and look for Gill VK6YL.

VK/VE/ZL NET

Friday at 2300 GMT on 28450, and look for Bobbie VE7CBK.

ALARA CONTEST

The proposed date for the contest is 14th November, 1981. Watch this column for details closed to the date.

Best wishes to all and please advise me of any new call signs, awards, etc.

73/33. Margaret VK3DML.

AROUND THE TRADE

Dick Smith announces the release of his Dick Smith Electronics Enthusiasts Catalogue 81-82'.

Produced in-house, this 11th edition of the catalogue is by far the biggest, most informative yet. It contains over 130 pages (some in full colour), packed with products and information for the electronic enthusiast.

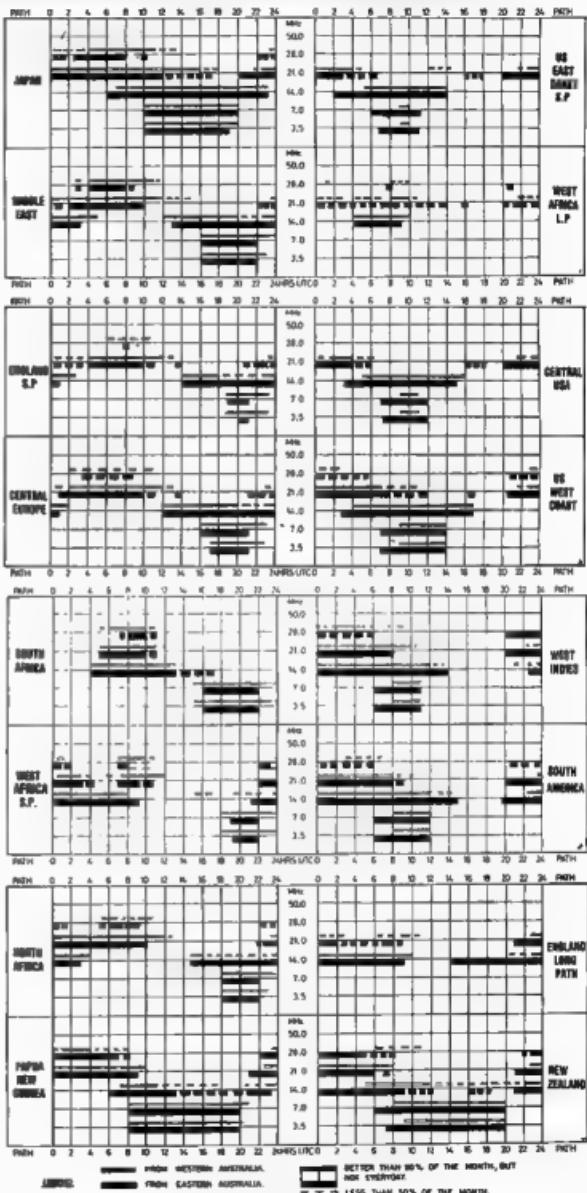
A new feature is a 30 page Data Information section including Broadcasting and TV Stations, Circuit Laws, DIN and Hi-Fi connections, Music Frequencies, Reactance/Frequency Chart, Transistor Data and lots more. There is also a chance for a lucky customer to win a free mail order whatever the value, just by being the 200,000th customer.

The "Dick Smith Enthusiasts Catalogue" can be obtained from any of Dick Smith's stores for 75c.

Your Advertisers support you
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IONOSPHERIC PREDICTIONS

Len Poynter VK3BYE



Predictions courtesy Department of Science and Environment IPS Sydney
All Times universal UTC (GMT)

LETTERS TO THE EDITOR

Any opinion expressed under this heading is the individual opinion of the writer and does not necessarily coincide with that of the publisher.

Bx 50, Sandgate, Qld 4017
Phone (07) 265 5175
5/3/81

The Editor
Dear Sir,

I am an active Intruder Watcher, but I do not have the equipment to copy many of the illegal transmissions. Many intruders use fast CW, RTTY, FAX and other modes.

This is a pet to amateurs and others who are able to get hard copy on these modes. Please help. I can supply cassette tapes of intruders, so it is not absolutely necessary for a helper to listen on the amateur bands.

Especially if someone can hard copy very fast Morse or RTTY at different speeds and shifts. I desperately need to hear from them.

For those who don't wish to write or phone, I can be contacted on the VK4KAL QSL Intruder Watch Net each Saturday night at 8:15 p.m. on 3540 kHz.

73s Bob McKernan VK4LG.

The Editor,
Dear Sir,

INTRUDER UMS

One of the strongest and most persistent intruders on the 15m band is the USSR Intruder UMS. This station operates intermittently (20-40 per cent of daylight hours and early evening) on 21032.4 kHz. Modes used are F1-RTTY, FS-RTTY, A1-CW fast and slow speed.

This intruder sometimes moves 100 kHz to avoid amateur signals. 99.9 per cent of Australian amateurs do not report intruders yet this is the only way that we stand any chance at all of eliminating this illegal and harmful interference from our once exclusive amateur bands. Participation in activities of the intruder Watch Service is the path to success. YOUR non-participation is NOW slowly depriving us all of the use of the amateur bands. Please to my fellow amateurs for assistance. The following information is requested by the IWS Date Time, Frequency Call Sign, Mode, RST, Bearing Details of Traffic. The Federal Net may be found Thursday 2030 EST on 3540 kHz. All are welcome to join.

UMS changed frequency to 21112 kHz on 14th April. It may change back to 21032 kHz.

VK4LG

Comment by VK3LC:

I thoroughly endorse the above.

For those members interested we can now translate most foreign languages to English.

If members hearing a foreign broadcast would put a read-out on tape we can identify the language and make appropriate reports. Go to it!

37 Second Avenue
Sefton Park SA 5065
April 8, 1981

The Editor,
Dear Sir,

I'd like to congratulate Chris Long on his excellent tribute to the late G.H. Miles VK2KL, featured in the April edition of Amateur Radio. The only time I have ever had a chance to see Low Definition Television (LDTV) was the night that Chris brought his gear to my QTH as reported in his article.

The two pictures printed with the said article are at once both better and worse than those seen with the naked eye. BETTER in that the Pictures Repeater on Rate of 8 per second causes frightful flicker - bad enough to give one a migraine! (Actually LDTV offers substantially better random noise cancellation than SSTV because of the rapid P/R!) WORSE in that LDTV gives a moving picture quite capable of showing the rapidly changing moods of the live human face.

It occurred to me as I watched that modern digital video storage techniques could do for LDTV what it already has done for SSTV - that is, produce a picture which can be viewed in comfort on any standard TV set. But unlike SSTV the LDTV pictures *were* in this way we amateurs might once again make a significant contribution to the development of a useful telecommunications tool!

In fact an American amateur, Henry Ruth KB2FO, in January of this year announced continuing development of the Mercury Discaler Fast Scan Television, a method of transmitting live pictures worldwide on any frequency band available without a satellite! (AS Television Magazine)

A 20 min. Unicam Videocassette is now available from me as WIA Videotape Co-ordinator in which Chris Long demonstrates his LDTV gear. Included are off-the-screen shots of the first live TV transmitted on HF between Melbourne and Adelaida as described in Chris' article.

73. John F. Ingham.

The Editor

Dear Sir,

We have read technical notes (not in a recent AR) describing a method of reducing the power of the FT-6102 to Novice requirements.

That method seems quite complicated and involves removing one of the 6146B tubes with a probable consequence of having to re-realise the PA stage.

We have used the following method with success. It may be noted that removal of covers on PA stage is unnecessary.

Remove the wire from the 320V tap on the power transformer and reconnect it to the 120V tap on the same winding (this is referred to as CT in the schematic). This reduces the HT to approximately half. Next locate the screen grid supply to the 6146B's, which goes between the 210V point on PB 1968 (Rect. B unit) and the feed through capacitor (C44). Remove wire from feed through and fit a small tag strip for support. Insert a 20W 1W resistor between the wires and the C44 thus reducing the screen voltage. Finally, adjust the Id current to 50 mA by means of VR1 on PB 1968 as described in the Instruction Manual.

You may prefer to read this as a technical note rather than a letter to the editor.

Yours sincerely,

S. B. Roberts VK3BSR

PO Box 128, Mt Druitt NSW 2770
Apr 2nd 1981

The Editor

Dear Sir

Through the medium of your column, would like to bring to the attention of your readers the following information. Mr Kenji Takahashi JHSADQ well known to many in Australia, is interested in corresponding with blind people, especially radio operators. Ken is currently learning to read and write in braille and a reasonably proficient already and has an excellent command of the English language. He is keen to write about radio and Japan or other subjects. His age is about 18 years and has recently completed senior high school and is studying for university entrance. He plans to study languages and hopes to become an interpreter eventually.

If anyone has a blind friend or knows of a blind operator would they please relay the information to them. Ken has asked that initially letters be short because of his commitments. The address is as follows:

Mr Kenji Takahashi
2-6-24 Aoba Chitose 055, Japan

or care of myself at the above address (with postage please).

Yours sincerely,

Colin Stevenson VK2VVA

25 Gosses Avenue,
Glenelg North SA 5045
2/4/81

The Editor,

Dear Sir,

I would like to express my grateful thanks to the Australian Post-Tel Institute Amateur Radio Club, South Australia, in assisting me along the road to recovery from my heart attack on 19th March, 1981.

The day following my attack the Club purchased a Kenwood TR2400 base stand and extension or microphone/speaker, which were loaned to me immediately. I came out of intensive care. Our funds were insufficient at the time but my brother (also a member of the Club) temporarily financed the purchase.

Many enjoyable QSOs were made during the week in general, care, and also at home using the Kenwood when convalescing and relaxing around the house instead of being tied to the shack.

Many thanks to Darryl VK5IN (President) and other members of the Club.

Yours faithfully

H. J. Townsend VK5HT

SILENT KEYS

It is with deep regret that we record the passing of —

Mr. M. R. ROTHWELL	VK2AER
Mr. A. G. SMITH	VK3AN
Mr. J. R. WOOD	VK8ZM
Mr. A. CHISHOLM	VK3BLG
Mr. J. KNIGHT	VK1JK
Mr. L. DODGE	VK7LD
Mr. F. A. HAAS	VK5FH

OBITUARIES

ALAN GLEN SMITH VK3AN

Alan Glen Smith VK3AN passed away at the age of 60 very suddenly on the 29th March, 1981. Alan will be sadly missed by all; he made many friends in ham radio and his journey through life.

Alan was a retired member of the SEC, with which he was apprenticed at the age of fourteen. He worked his way up to become a Supervisor. He was held in high esteem by his workmates and all who knew him. Unfortunately Alan only enjoyed eighteen months of his retirement.

Alan became a Ham in February 1947 and was a member of the WIA from January 1948, a member of the Old Timers' Club, a constant supporter and visitor to as many conventions as was possible to attend, always entering into the spirit of those.

His everyday on-the-air companions would like me to say how much they have valued his friendship; my XYL and myself would like to add our deep appreciation and thanks for his companionship, his memory will ever be with us all.

The many who knew Alan would like me to tender their condolences to his wife, Nancy, and daughter, Glennis, on their sad loss.

A gentleman at rest.

Len Sole VK3NZX.

FRED HAAS VK5FH
It is with deep regret we record the sudden passing of Fred Haas VK5FH on 15/4/81.

Fred had a call sign for over 50 years, and started with a UC prefix (in the days before Austria had the OE prefix), then became OE1FH prior to coming to Australia before the last war, when he joined the Wireless Institute as a VK2 for a short time before settling in VK5.

His enthusiasm was boundless, and he delighted in meeting visiting overseas amateurs and showing them around South Australia, of which he was terribly proud.

He made many friends over his 800 ft. long wire, and regaled all with tales of how his cows trampled through the delta loop he was building, and of watching the bushfires catch his mast alight.

He will be affectionately remembered for his cheerfulness, encouragement and happy nature.

We extend our condolences to Erika and family.

Amateur radio will be the poorer for his passing.

Vale Fred.

Brian Austin VK5CA.

HAMADS

- Eight lines free to all WIA members, \$9 per 3 cm for non-members.
- Copy in typescript please or in block letters to P.O. Box 150, Toorak, Vic. 3142.
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FOR SALE

Kyukotsu 2m FM-2025A Mk. II, 2 months old, \$300; also 8 el. 2m yagi, \$35. Phone Don VK2DXH (049) 49 8852 or QTHR VK2VNP.

Icom IC-22A, exc. cond., with inst. manual and case, xtal for rpts. 2 to 8, simplex 40, 49, 50, orig. no mods., \$200 or offer. VK3YLN. Ph. (03) 842 2260.

Icom IC-225A 2m Tx/rvr., \$380; universe 24 ch. 10m Tx/rvr., \$80; McCulloch 1.5 kVA 240V generator, all just reconditioned. \$280. Les VK1NSK, QTHR. Ph. (062) 84 9226.

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Yates FT101Z with desk mic., \$400. David Boehm VK1UD, QTHR. Ph. (062) 54 8862 AH.

Kenwood TS-420S with VFO \$20, 500 Hz CW filter and DC-DC converter, the lot \$900, may negotiate. Tim VK3BCN, Ascot Vale. Ph. (03) 370 6092.

Kyukotsu 2m Mobile, \$285; Ken 2m HAM 40, 50, R2, R8 rubber duck mics and charger, \$175; standard 2m HAM, 40, R2, R8, Ch. 50, hand mic., carry case, \$200; VK3 carphone, 25W 40, R8, \$105. Graeme Thomson VK7ZGT. Ph. (003) 44 4773.

Ham Shack Clear-out: Heathkit TAC102 Tx/rvr. 80-10 with mic., processor, AC/DC and antennas, \$465; SSTV modulator, \$100; camera, tripod, speaker, cables and tapes, complete set-up, \$655; PT110 Tx/rvr., 26.8-29.1 MHz continuous tuning, [VFO], 5 digit readout, SSB and AM, 35W PEP 12V, with mic. and acc., \$275; linear amp. 20-11M, 300W PEP 12V solid state; match to PT1110 radio, very small, \$155; antenna triband beam (10-15-20), 8 el. on 40 ft. boom, \$475; rotator, Ham III, with 100 ft. cable, \$240; tower, 30 ft., \$46; UR67, \$1.33 m.; R8, \$0.35 m.; also used cable cheaper; coax relay, 12V, 900 MHz, \$13; dummy load, 1 VHF PEP oil, \$25; phone patch, \$25; headphones, \$2; \$1464. RCA (new), \$8; \$883B (12V 8146B), new, \$5; 2N5591, \$8; 2N5590, \$8; all equip. and parts in exc. cond. Jim VK2CK, QTHR. Ph. (062) 78 2545.

RTTY Gear: Complete working system, but requires 240V/115V AC. It's/former, comprises 2 model 15 teletype printers with covers, 1 series governed motor on 45-45 baud, the other synchronous at 50 baud, ETI/mod/demod carefully built in attractive comm. box, HR 150V low supply with 4 inputs, instruction manual, all working in exc. cond., \$180 the lot — HF gear: Icom IC-701 Tx/rvr. and PSU with RM3 external remote controller, manuals, mic., exc. cond., no mods., \$1050; Alide 103 100W output, 80, 40, 20m Tx/rvr., fully solid state, suit as mobile or spare Tx/rvr., as new, 12 pole zstat filter included, mic., manual, \$475 — VHF gear: Kenwood TS700A all mode 2m Tx/rvr., 144-146 continuous tuning in 4 x 1 MHz steps, 1 kHz analog readout, 100 kHz calib., mic., manual, 4 yrs. old, exc. cond., \$570 — Receiver: Kenwood R1600, as new, no mods., \$450. All above equipment can be seen operating, genuine reasons for sale, may consider genuine offers. B. Batho VK3JUV, QTHR. Ph. (03) 6424 8401.

FT101E Tx/rvr., with FV101 ext. VFO, mic., DC-DC lead, exc. cond., \$700 the lot. ONO. Tom Allen VK7AL, QTHR. Ph. (002) 43 9192.

Yaesu FT-221B with YG-221 digital display and YD148 desk mic. and hand-held mic., \$500. ONO. Oicom IC-22A repeater, 2-4 and 40, 50 simplex, v.g. cond., \$185. ONO. 52-54 MHz linear amp., homebrew, 6-40 in output, built-in power supply, \$60. ONO. VK3BIB, QTHR. Ph. (055) 62 4630.

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Macromatic interface, to suit TRS/BC-M-800 and M-80, full instructions, software, etc., \$275. VK4NKC. OTHR.

Yates FT2100B linear amplifier, exc. cond., with handbook, \$380; Cuscraft 2m 20el. cross yagi beam, 12 dB gain, \$55. Steve VK3JY, QTHR. Ph. (03) 888 3841.

Collins 301 Linear Amplifier, overhauled recently by former Collins Co. engineer. 4 x 572Bs replaced, immaculate cond., used less than 100 hours, \$750. Roth Jones VK3BG. Ph. (03) 873 3333 BH.

Galaxy V Mk. III, exc. cond., ext. VFO, CW filter, VSWR op., 2 spars avail., new, spare valves. USSR, LBB, good and clean, \$320; Galaxy Rx, SSB, filter, CW, AM, type R209, mint cond., orig. case with handbook, clean, works OK, no mods., beautiful museum piece, \$120; Galaxy Trx, TR222, matched with above Trx, clean, no mods., mint cond., AM only, 6146, col. 803s mags., museum piece, \$120; BC348, good and clean, no mods., but with ext. PS, \$65. VK4LN. Ph. (071) 82 2675.

Yates FTDX600 with matching speaker and desk mic., spare valves, \$400. ONO. VK4AWR, QTHR.

FT161, mint cond., finals never used, \$450; FTV650 FT5105 front end, \$683 final, \$180; BC22, little used, reprt. ch. 3, 5, 6, 8, ch. 40 simplex, \$175. VK2ZAB, QTHR. Ph. (049) 549 7353.

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QSP

GEELONG REPEATER

Unfortunately the Geelong Repeater will be off the air for an extended period due to recent theft from the top of the receive filter and coax cable. Geelong police are investigating the incident along with other repeater sites throughout the past fortnight. The GARC Committee has recommended the construction of a brick enclosure for the receiver to improve security. Funds need to be raised to cover the replacement cost of the receive filter. ■

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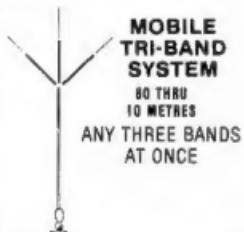


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